



3

FDD
FILE
COPY

DATA ON USSR EXTRACTIVE INDUSTRIES

Number 3

15 April 1958

DOC 3	REV DATE 030950	BY 010956
ORIG COMP	OPI 25	TYPE 30
ORIG CLASS 14	PAGES 60	REV CLASS 4
JUST	NEXT REV	AUTH: HR 70-2

Prepared by

Foreign Documents Division
CENTRAL INTELLIGENCE AGENCY
2430 E. St., N. W., Washington 25, D.C.

PLEASE NOTE

This report presents unevaluated information selected from Russian-Language publications as indicated. It is produced and disseminated as an aid to United States Government research.

DATA ON USSR EXTRACTIVE INDUSTRIES

Table of Contents

	<u>Page</u>
I. Chemical Industry	1
General	1
Agricultural Chemicals	1
Basic Chemicals	7
Coke Chemicals and Petrochemicals	8
Plastics	12
Rubber and Rubber Products	13
Miscellaneous	15
II. Petroleum and Natural Gas Industries	16
USSR in General	16
Ukraine	22
Ural-Volga Region	23
Central Asia	23
Azerbaijan	23
III. Ferrous Metallurgy	27
Production	27
Technology	31
High-Grade Steel	33
Deposits, Mines, Plants	34
IV. Nonferrous Metallurgy	36
Production	36
Technology	36
Deposits, Mines, Plants	38
Miscellaneous	41

	<u>Page</u>
V. Coal Industry	42
General	42
Production	44
Technology	46
Construction and Investment	48
Prospecting	49
VI. Other Solid Fuels	52
Peat Production	52
Shale Production	55

I. CHEMICAL INDUSTRY

General

INCREASED CAPITAL INVESTMENT IN USSR CHEMICAL INDUSTRY -- Moscow, Trud, 4 Feb 58

The 20th Congress of the CPSU has established an outline for development of the Soviet chemical industry. According to the estimates of the 15-year long-range plan, the chemical industry will play a very important part in satisfying the growing requirements of all branches of production and of the nation's consumers. During 1958, capital investment in the chemical industry will surpass 1957 by more than 50 percent. Furthermore, the amount of construction of synthetic fiber enterprises will be 75 percent greater and of plastics enterprises 150 percent greater.

Agricultural Chemicals

NEW FERTILIZER VARIETIES IN USSR -- Moscow, Standartizatsiya, No 6, Nov/Dec 1957, pp 70-71

The USSR chemical industry is setting up the production of new varieties of solid and liquid inorganic fertilizers which will soon be widely used in USSR agriculture. Several of these new types are listed below, with a short description of each.

Double superphosphate

At present, the basic phosphorus fertilizer, containing phosphorus pentoxide (P_2O_5) in water-soluble form, is common superphosphate. At best, even when prepared from apatite concentrate, it contains about 20 percent assimilated P_2O_5 . Consequently, to give the crops one ton of phosphorus pentoxide it is necessary to apply about 5 tons of superphosphate to the soil. This nonproductive expenditure becomes even more sharply pronounced when superphosphate from Kara-Tau phosphorites is employed. This may contain only 15 percent of assimilable P_2O_5 .

On the basis of experiments made on the production of extraction phosphoric acid from apatite concentrate and, through it, double superphosphate, plans are currently being completed for a shop which will produce double superphosphate of the granulated variety. The fertilizer will contain 50.7 percent common, 45 percent water-soluble, 48.2 percent assimilable, and 2 percent free P_2O_5 .

A process has been worked out for the production of double superphosphate from apatite concentrate by means of phosphoric acid obtained from apatite ore or apatite concentrate by an electrothermal method. The composition of the fertilizer has still not been definitely established, but the content of P_2O_5 in it will be several times higher than in double superphosphate from extraction phosphoric acid.

The Kara-Tau phosphorite contains up to 4.6 percent magnesium oxide. Under ordinary conditions it is impossible to obtain double superphosphate from this phosphorite without concentration. From concentrated Kara-Tau phosphorite it is possible to produce double superphosphate by the usual method. At present, work is being done on the concentration of this phosphorite by means of flotation, experiments have been made on concentrating it by a chemical method, and a process for introducing magnesium oxide for the solution of phosphoric acid is being studied.

Recently, a new, simple, and economical method has been found for producing double granulated superphosphate from the nonconcentrated Kara-Tau phosphorite which will contain 47.3 percent regular, 37-39 percent water-soluble, 43.4 percent assimilable, and 3-6 percent free P_2O_5 .

Ammofos-ammonium phosphate

Ammofos contains highly concentrated P_2O_5 nitrogen, mainly in the form of ammonium phosphates. Compared with simple superphosphate, this fertilizer has the same advantages as double superphosphate. The results of tests have helped in the planning of the first shop for the production of ammosfos from Kara-Tau phosphorite. The fertilizer will contain 48 percent regular, 47 percent assimilable, and 34 percent water-soluble P_2O_5 , 10.7 percent nitrogen, and 7 percent magnesium oxide.

Nitrofoska

These are products containing nitrogen, phosphorus, and potassium and are formed as a result of the breakdown of phosphorite or apatite by nitric acid and the subsequent treatment of the products of this separation. Nitrofoska is a concentrated fertilizer containing not less than 35 percent nutritious elements (N -- 15 percent, assimilable P_2O_5 -- 10 percent, and K_2O -- 10 percent).

At present, the production of nitrofoska and calcium nitrate is being made ready. The construction of several shops for nitrofoska production according to the simplified method is planned.

Defluorinated phosphates

These fertilizers contain P_2O_5 in assimilable form and very small amounts of fluorine (0.1-0.3 percent).

Advantages of defluorinated phosphates are the economy in sulfuric acid during production and the large content of phosphorus pentoxide. This nonacid product has excellent physical properties, but as a consequence of the presence of P_2O_5 in water-soluble form it can be used only on certain kinds of fields.

At present, experiments are being completed on the production of defluorinated phosphates from apatite concentrate. Tests have given positive results. The proposed content of assimilable P_2O_5 in the finished product amounts to 32-34 percent and of fluorine about 0.1 percent.

Basic experimental work has been done which is designed to produce defluorinated phosphate from the Kara-Tau phosphorites. A product has been developed with a content of 20-22 percent assimilable P_2O_5 and 0.05 percent fluorine. The first tests on the use of this fertilizer have shown it to be highly effective.

Liquid nitrogen fertilizers (ammoniates, liquid ammonia, and ammonia water).

In the effectiveness of their nitrogen content all of these are approximately equal. The advantage of these fertilizers is the possibility of their use without the preliminary conversion into a solid product. This significantly reduces the cost of the nitrogen but does not impair its effectiveness.

Boron fertilizers

Fertilizers containing boron are most effective when applied to the seed of perennial grasses, vegetables, fodder, and other crops. After application of 6-9 kilograms of boric acid, the yield is several times as great. Boron fertilizers eliminate a number of diseases of such crops as root crops, flax, and turnips, speed up their maturing, lengthen the period of storage, and increase their yield and quality.

Magnesium borates

These are now obtained by treating the wastes of boric acid production. They contain 6 percent of H_3BO_3 . These fertilizers also contain magnesium sulfate and are known as boron-magnesium fertilizers. To ensure more complete utilization of the wastes of boric acid production, as well as to reduce the cost of boron fertilizers, a more modern method for producing magnesium borates, containing boron in assimilable form, has been developed. On the basis of laboratory and pilot plant tests, plans have been drawn up and installations are being constructed for processing the wastes of boric acid into fertilizer at two plants.

Boron-datolite fertilizers

According to plans, the needs of agriculture for boron fertilizers will be satisfied in large part by the treatment of the datolite raw material of the Far East. A product containing boric acid in water-soluble form is being produced. This fertilizer may be used for application to the soil and also for above-root [vnekornevoy] feeding of crops.

The required experimentation is being conducted and plans are being drawn up for construction of the first shop for production of boron-datolite fertilizer by means of sulfuric acid. The quantity of boric acid in the fertilizer will depend on the content of boron in the raw datolite ore; on the average, it will amount to about 9 percent. The cost of one ton of boric acid in this fertilizer will be much lower than in boron-magnesium fertilizer.

Boron double superphosphate

Boron fertilizers are always introduced into the ground on a background of phosphorus. Therefore, it is very important to develop a combined fertilizer containing both components. Boron double superphosphate is such a product. It is produced by treating datolite raw material with extraction phosphoric acid and contains boric acid and phosphorus pentoxide in combinations recommended by agricultural science. Tests on breaking down the far eastern datolite with extraction phosphoric acid, obtained from apatite concentrate or Kara-Tau phosphorite, have shown that for the production of boron double superphosphate it is possible to use both kinds of acid indicated. The fertilizers will differ in quantity of boric acid and admixtures contained in the phosphoric acid. The boron double superphosphate, produced from the acid from apatite, will have 36 percent assimilable P_2O_5 and about 8 percent H_3BO_3 , and the product produced from acid obtained from phosphorites will have 36 percent and 6 percent, respectively, as well as certain amounts of magnesium phosphates. Both superphosphates will be produced in granulated form.

Moscow, Udobreniye i Urozhay, No 2, Feb 58, p 62

In the chemical enterprises of the Ukrainian SSR new inorganic fertilizer varieties are being produced. The Dneprodzerzhinsk Nitrogen Fertilizer Plant is putting out an experimental consignment of fertilizer consisting of a mixture of nitrogen, phosphorus, and potassium.

A large shop for the processing of a new type of phosphorus fertilizer, defluorinated superphosphate, is being put into operation at the Sumgait plant. All the basic production processes have been automatized and mechanized. Four large rotating roasting furnaces have been installed. A shop for the production of granulated superphosphate has been equipped at the Sumgait plant.

The production of potassium sulfate has been mastered at the Kaluga Chemical Combine.

The "Maardu" Chemical Combine at Tallin has put out the first consignment (14,000 tons) of a new type of fertilizer called "phosphate mixture." This fertilizer is prepared by mixing superphosphate and phosphorite flour in a ratio of 1:1. In 1957, the mixture was tested on the crops of the experimental stations of Estonia and proved to be very effective. It is intended for use in the feeding of perennial grass and grain crops.

The Stalinogorsk Chemical Combine has begun the production of a new type of nitrogen fertilizer, granulated saltpeter. It has a number of advantages over the flaky variety, such as greater stability, greater assimilability in the soil, and better dispersion qualities. Granulated saltpeter will be produced in the recently constructed shop which is now being equipped.

The scientists of the Institute of Chemistry of the Academy of Sciences Azerbaydzhan SSR, in cooperation with specialists from the Baku Iodine Plant, have devised an original method for obtaining boron compounds from bore water (oil wells).

The bore water of the Baku fields, together with the petroleum, contains compounds of boron in small concentration. A simple and practical method, using local mineral raw materials such as dolomite to process the bore water, is applied by scientists, who obtain a valuable product in this way, a powder containing 4-6 percent of boric anhydride. This product is ready for use as a fertilizer. A 2-year test has shown it to be highly effective. The yield of cotton in fields where it has been used has increased 30 percent.

The scientific associates of the Kazan' Agricultural Institute have worked out the technology for the production of the valuable fertilizer precipitate (pretsipitat) from the wastes of a gelatin plant. From these wastes, the Industrial Artel' imeni Kirov, in 1957, produced about 500 tons of precipitate. The cost per ton of this fertilizer is about 60 rubles. Tests have shown that precipitate is as effective as industrial superphosphate.

FAILURES IN USSR FERTILIZER INDUSTRY -- Moscow, Izvestiya, 16 Jan 58

Despite its enormous raw material resources, the USSR chemical fertilizer industry has failed to live up to its capabilities.

[The condensed text on criticism of the Soviet inorganic fertilizer industry appears in The Current Digest of the Soviet Press, Vol 10, No 3, 26 February 1958, p 29.]

PROGRESS REPORT ON CHARDZHOU COMBINE -- Ashkhabad, Turkmeneskaya Iskra,
3 Jan 58

The Chardzhou Superphosphate Plant is one of the largest and most important projects of the Sixth Five-Year Plan. The importance of this future chemical combine becomes evident when it is realized that half of the fertilizer requirements for the cotton fields of the Central Asian republics will be met by the output of this enterprise.

The project consists of a complex of large structures with a workers' settlement and thermoelectric power station nearby. The latter will take care of the electric power needs not only of the enterprise but of the city of Chardzhou and the surrounding kolkhozes as well.

Construction of the producing elements of the plant is now in full swing. The initial heavy work on the main buildings -- the TETs (heat and electric power station), the mechanical shop, the water-supply offices, the transport facilities -- has all been completed. Construction of the basic shops is being started. A high-voltage electric power line for the pumping station located on the banks of the Amu-Dar'ya River has been set up.

Railroad spurs have been laid to the plant area which will connect the enterprise with the main-line Ashkhabad Railroad.

INFERIORITY OF KARA-TAU PHOSPHORITES STRESSED -- Moscow, Sel'skoye Khoz-yaystvo, 25 Feb 58

In the next few years, the variety of phosphorus fertilizers in the USSR will be significantly expanded. A basic role in agriculture will be played by concentrated phosphoric fertilizers, the production of which, according to the decisions of the 20th Congress of the CPSU, should be increased to approximately a million tons a year. In a short time, a plant for the production of defluorinated phosphates will be built in the Ukrainian SSR. The production of ammoniated superphosphate has been started in Central Asia. It has also been decided to manufacture liquefied phosphates.

The production of superphosphate from Kara-Tau phosphorites, which was started during the post-World War II period, has now run into a number of serious difficulties. To obtain superphosphate containing 14 percent P_2O_5 , it is necessary to add to the phosphorite meal produced from Kara-Tau phosphorites Khibinsk (Kola Peninsula) apatite concentrate or expensive bone meal. Such a situation should not be permitted to last for long. The Ministry of Chemical Industry must solve the problem of concentrating the Kara-Tau phosphorites at the earliest possible moment.
-- G. Borkov, Deputy Minister of Agriculture USSR

Basic Chemicals

FLUORSPAR DEPOSITS OF USSR -- Bol'shaya Sovetskaya Entsiklopediya -- SSSR (Large Soviet Encyclopedia -- USSR), Moscow, Gosudarstvennoye Nauchnoye Izdatelstvo "Bol'shaya Sovetskaya Entsiklopediya," 1957 (B. A. Vvedenskiy, editor in chief), p 45

Fluorspar ores are composed of several types: quartz-fluorite with a content of 37-87 percent fluorite, sulfide-fluoride with 40 percent fluorite, and silicate-fluorite. Very large deposits of fluorspar are found in the Primorsk region, the East Transbaykal, and Central Asia. The large Voznesenskoye Silicate-Fluorite Ore Deposit is situated in the area of Primorskiy Kray. In the Transbaykal, quartz-fluorite deposits (Kalanguyskoye, Solonchukoye, etc.) are located in widely scattered areas. In Central Asia are the very large deposits of Naurgazanskoye and Takob in the Tadzhik SSR. There are also fluorite ore deposits in Tuvinskaya Autonomous Oblast, East Siberia, Kazakhstan, and Kirgiziya.

NEW TECHNIQUES IN ALAVERDI COPPER SULFATE SHOP -- Yerevan, Kommunist, 27 Dec 57

There have been some new innovations in the copper sulfate shop of the Alaverdi Copper-Chemical Combine. A conveyer is being assembled which will load the finished product into railroad cars, and special equipment is being installed which will permit the introduction of a new method of producing copper sulfate. Earlier copper sulfate was produced by roasting the white mat [belyy mat]. In this operation a large quantity of harmful gases escaped. According to the new method, during the roasting, granules in the form of hollow copper pellets will be used. The formation of harmful gases will be completely eliminated.

NEW POTASSIUM PERMANGANATE SHOP AT RUSTAVI PLANT -- Tbilisi, Zarya Vostoka, 1 Jan 58

Three months ago, the "Khimpromstroy" Building Administration completed the construction of a potassium permanganate shop at the Rustavi Nitrogen Fertilizer Plant. Tests were conducted in the new shop until the end of December, and on the last day of the month, the shop finally went on stream.

In honor of the occasion, several individuals spoke, including L. Petriashvili, a shift foreman in the new shop, who, on behalf of the workers of the Rustavi plant, pledged that the shop would master the mass production of potassium permanganate. N. Chipashvili, director of the plant, stated that the new shop represented still another victory in the growing chemical industry of the Georgian SSR. Others present at the meeting included R. Agladze, academician of the Academy of Sciences Georgian SSR, and G. Chogovadze, chairman of the Georgian Sovnarkhoz.

Potassium permanganate is used in many branches of the economy. This new shop is the first of its kind to be put in operation in the Soviet Union. The technology for the production of potassium permanganate by the electrolytic method was worked out by Academician Agladze.

FURFURAL FROM OAK WOOD WASTE -- Moscow, Sovetskaya Rossiya, 14 Jan 58

Every year, the Shumerlya Tanning Extracts Plant "Bol'shevik" processes more than 100,000 cubic meters of oak wood. Twenty-five percent of the wood has gone into waste which was burned in the furnaces of the electric power station.

Now, the manufacture of furfural from the waste material is being set up. This product is used in the production of plastics, varnishes, paints, and artificial resins and is used to treat grain and beets and to preserve dried milk.

In 1958, up to 5,000 tons of furfural will be produced from these oak wastes.

Coke Chemicals and Petrochemicals

USSR COKE AND PETROCHEMICAL PRODUCTION TO INCREASE -- Moscow, Trud, 4 Feb 58

According to preliminary estimates, in 15 years the annual output of petroleum in the USSR will amount to 350-400 million tons and gas to 270-320 billion cubic meters. The annual production of pig iron will reach 75-85 million tons and for this purpose roughly 100 million tons of coke will be needed. In processing such quantities of petroleum, gas, and coke, the Soviet Union will be able to obtain more than 20 million tons of chemicals, which is 50 percent more than the US turned out in the processing of petroleum and gas in 1955.

DEVELOPMENT OF AZERBAIDZHAN PETROCHEMICAL INDUSTRY -- Baku, Azerbaydzhanskoye Neftyanoye Khozyaystvo, No 11, Nov 57, pp 30-33

In the USSR petrochemical industry, plastics production holds first place both from the standpoint of tonnage and from capital investment. Within plastics, the vinyl group leads in terms of output. Its synthesis is based on the works of Academician Favorskiy.

In the production of various types of vinyl plastics, the basic raw material is acetylene, a large share of which is obtained from natural gas.

Until recently, polyethylene was produced by the polymerization of pure ethylene under a pressure of 1,200-2,000 atmospheres at a temperature of 200 degrees. Now the new Ziegler method for the production of polyethylene will no doubt contribute to an increase in the demands for this plastic.

The high quality of polyethylene plastics and the presence of sufficient potential reserves of ethylene in Azerbaydzhan will permit a sharp increase in its production here during the Sixth Five-Year Plan.

According to the directives of the 20th Congress of the CPSU, the plan for increasing the processing of synthetic materials for the production of artificial fibers in the USSR call for a rise to 5.9 times the present level. The volume of production of artificial fiber by 1960, the last year of the Sixth Five-Year Plan, has been set at 330,000 tons.

In the USSR the production of artificial fiber based on petroleum hydrocarbons is still only in the beginning stage of industrial production. The potential resources available are sufficiently large so that the goal set by the 20th Congress for a large increase in artificial fiber production can be successfully attained.

Among the various types of production based on the chemical processing of petroleum gases, one of the most important is synthetic rubber. According to the decision of the 20th Congress, the output of synthetic rubber during the Sixth Five-Year Plan was to increase 120 percent. Two methods will be used by the Ministry of Chemical Industry to accomplish this goal:

1. The hydration of petroleum ethylene, followed by the conversion of the ethyl alcohol obtained thereby into divinyl, according to the Lebedev method.
2. The catalytic dehydrogenation of the hydrocarbons of the C_4 series in diene hydrocarbons with a conjugated bond.

The production cycles for the synthesis of alcohol from ethylene, including gas-fractionation, pyrolysis, hydration, and other subsidiary operations, are being carried out on a large industrial scale. There is a large plant in Baku which manufactures alcohol from petroleum gases on the basis of the reaction worked out by the Russian chemist A. M. Butlerov.

This reaction was carefully studied and improved by the workers in the AzNIINP (Azerbaydzhan Scientific Research Institute for Petroleum Industry) imeni V. V. Kuybyshev. The experiments were completed in 1935-1936, plant equipment was set up, and industrial runs were instituted. This installation was the first of its kind in the world.

During the war, a method was worked out and introduced into industrial operation which provided for the direct hydration of ethylene into ethyl alcohol. Several new plants were planned and constructed on the basis of this method.

Petroleum gas serves as an important source of large amounts of butane and butylene for the production of synthetic rubber. The conversion of these products has been worked out in detail by Soviet scientists, particularly in the laboratories of A. A. Balandin and B. A. Kazanskiy.

As a result of this work, as well as the experimentation conducted by AzNIINP, industrial complexes are now being constructed at the synthetic rubber plant in Sumgait.

Great interest is being shown in the development of a method of producing isoprene rubber from petroleum pentanes and amylenes. Consumers have borne witness to the exceptionally high quality of isoprene rubbers.

The reaction of the dehydrogenation of pentanes and amylenes into isoprene is being studied in a whole series of institutes of the Soviet Union, including the Institute of Organic Chemistry of the Academy of Sciences USSR, Moscow University, and others. The development of an effective method of converting pentane amylene fraction into the starting point for synthetic rubber will require a great effort on the part of scientific and engineering personnel. Experiments in this field should be expanded with the aid of academic and industrial institutes, higher educational institutions, planning organizations, and production enterprises.

In addition to the starting materials for synthetic rubber production mentioned above, other resources for this purpose may be the isobutylene and isobutane which can be dehydrogenated into isobutylene. The development of the production of new types of synthetic rubber -- butyl rubber -- may be undertaken by the introduction into the sphere of chemical processing of isobutylene.

In the field of fertilizer production the requirements of USSR agriculture for nitrogen fertilizers, in particular the more assimilable of these -- ammonium nitrate, amount to approximately 15-20 million tons a year.

The decisive link in the synthesis of ammonium fertilizers, taking into consideration the whole economy of production, is the production of hydrogen. The cost of hydrogen in the over-all cost of ammonia production amounts to more than 50 percent.

As early as 1932-1935, Soviet scientists were working and experimenting on an industrial scale on a method for the production of hydrogen by the catalytic conversion of methane in the presence of steam. The hydrogen obtained by this method is employed in the synthesis of ammonia and ammonium fertilizers. An analysis of ammonia production shows that the most profitable method of its production is that based on hydrogen obtained from petroleum gas.

The Azerbaydzhan SSR, with its large resources of natural and synthetic petroleum gas, is supplied with all the necessary prerequisites for the organization of a synthetic ammonium nitrate industry.

POTENTIAL SULFURIC ACID SOURCES IN UKRAINE -- Kiev, Pravda Ukrainy, 7 Jan 58

Up to now, the sulfuric acid industry of the Ukrainian SSR has been based on pyrites, as a raw material source, which are brought in from considerable distances. This material is brought in from the Urals and from Kazakhstan and, therefore, the cost of transportation must be added to the final cost of output. The cost of transporting pyrite to the Ukraine sometimes exceeds the cost of the pyrite itself.

However, the import of pyrite is quite unnecessary. There is potentially sufficient raw material for sulfuric acid production in the Ukrainian SSR. There is, first of all, the hydrogen sulfide of coke gas. The latter product, manufactured by the coke-chemical enterprises of the republic, would be sufficient to yield hundreds of thousands of tons of sulfuric acid. The use of gas refined from hydrogen sulfide for heating open-hearth furnaces would permit not only an increase in the quality of smelted steel but would also reduce the smelting period 30-40 minutes. However, in the majority of coke-chemical plants the hydrogen sulfide is at present not recovered from the gas.

Another important source of raw material for sulfuric acid manufacture can be the wastes of the coal-concentrating factories. By adding a small amount of additional equipment to the coal-cleaning plants, during the cleaning of the coal it may be possible to obtain from the gangue a considerable amount of carbonaceous pyrite (0.7 percent of the total amount of concentrated coal). It is particularly useful when mixed with iron vitriol; but to obtain iron vitriol, it is necessary to set up facilities for concentrating the tailings of pickling solutions in metallurgical and metal parts plants.

Experience has shown that by the use of only the three types of local waste raw materials mentioned above, it would be possible annually to produce in the Ukrainian SSR more sulfuric acid than is now put out by the sulfuric acid plants of the republic.

Plastics

POLYMER INDUSTRY GROWS -- Moscow, Pravda, 8 Jan 58

The polymer industry in the Soviet Union and its satellites, as well as in other countries of the world, has shown a tremendous growth in recent years.

[Excerpts from this article on the rise and development of the chemical processing of synthetic products in the USSR and its satellites appear in The Current Digest of the Soviet Press, Vol 10, No 1, 12 February 1958, p 24.]

REORGANIZATION OF ARMENIAN PLANT -- Stalinabad, Kommunist Tadzhikistana, 29 Dec 57

The plastics plant in the Armenian SSR, which specializes in the output of plastics parts for all the instrument building plants of the republic, has been reorganized.

NEW PLASTICS PRODUCTS AND PROCESSES -- Moscow, Moskovskaya Pravda, 1 Jan 58

Experimentation in the USSR has shown that it is possible to make plastics possessing the same strength as steel. Quite recently, such material was produced in Moscow by workers of the scientific research institute and the plastics plant.

"Plastic steel," as it is called, is produced from synthetic epoxy resins and metallic fillers and is not in the least inferior to regular steel. The first dies for the manufacture of various parts processed from it at the Moscow Motor Vehicle Plant imeni Likhachev and the Gor'kiy Motor Vehicle Plant have already given excellent results.

In 1958, the new material will be introduced into many industrial enterprises of Moscow and Moskovskaya Oblast.

Great interest is being shown in still another innovation, a ship with a displacement of 18 tons for the transport of lumber manufactured completely from "stekloplastik" [plexiglass?]. The Leningrad shipbuilders are participating in its construction.

Moscow, Moskovskaya Pravda, 3 Jan 58

In the metallization laboratory of the All-Union Institute for the Autogenous Processing of Metals (VNIIAvtogen), a new method for spraying plastic on various metals and other materials has been worked out. Special equipment has been devised and tested for this experiment.

From a special device, plastic, heated in a flame of hot gas, is directed in a stream and is precipitated in uniform and fine layers on metal, concrete, wood, and any other material.

This original method opens wide possibilities in industry. Plastic may now be applied in fine layers to pipes, vats and other articles in order to preserve them against the action of acids and rust. Much tin [olov] is expended during the assembly of light motor vehicles. Now, instead of using this expensive and deficient metal, all the defects on the body of the automobile may be hidden by spraying it with plastic.

Rubber and Rubber Products

FOREIGN EXPORT OF RUSSIAN TIRES -- Moscow, Vechernyaya Moskva, 2 Dec 57

Every month, the Moscow Tire Plant is expanding its export of tires to foreign countries. In November, shipments were made to Poland, East Germany, Hungary, and Vietnam.

SOVIET MACHINES SUPERIOR TO AMERICAN -- Moscow, Sovetskaya Rossiya, 27 Nov 57

On 26 November 1957, delegations of workers from the rubber industries of China, Czechoslovakia, Poland, Bulgaria, Hungary, and East Germany departed from Yaroslavl after a visit at the Yaroslavl Tire Plant. These people were given detailed information on the equipment and progressive production technology at the plant.

"The new semiautomatic machines appeal to us particularly," said Sigmund Becker, chief constructor of the "Stomil" Tire Plant in Posnan. "They make it possible to mechanize all the laborious operations in the assembly of motor vehicle tires. None of the capitalist countries have such machines. The Polish tire manufacturers assemble tires on machines of American make. Work on these machines requires a considerable amount of muscular exertion. Therefore, we have now ordered semiautomatic assembly machines in the Soviet Union. The Soviet equipment will permit us to increase our output significantly and to ease the work burden."

"Much of what we have seen and learned about here," said Ch'an Lin, director of Tire Plant No 1 in Mudan'tse [Mu-tan-chiang?] of the Chinese People's Republic, "We are endeavoring to introduce into the tire enterprises of China. Thank you for your help, Soviet friends."

SYNTHETIC RUBBER CONFERENCE IN KARAGANDA -- Alma-Ata, Kazakhstanskaya Pravda, 29 Dec 57

The Karaganda Synthetic Rubber Plant is the largest plant in the USSR for the production of calcium carbide. The Temir-Tau carbide workers have accumulated considerable experience in the high-production exploitation of the largest furnaces in the Soviet Union and willingly share this knowledge with workers in other plants of the country and of other countries of the socialist camp.

For 3 days, an all-union conference on problems of planning and operation of carbide plants and shops was held in Karaganda. The meeting was organized by the Ministry of Chemical Industry USSR, the Karagandinskiy Sovnarkhoz, and the Karaganda Synthetic Rubber Plant.

Participating in the work of the meeting were representatives of the Kirov Chemical Combine, Yerevan Plant imeni S. M. Kirov, Chernorech'e Chemical Plant, Karaganda Synthetic Rubber Plant, associates of scientific research and planning institutes, and administrators of the Ministry of Chemical Industry and the Karagandinskiy Sovnarkhoz.

At the meeting associates of the Scientific Research Institute for Rubber (Giprokauchuk) presented the following papers: E. E. Yudovich, "Analysis of Domestic and Foreign Carbide Production, New Courses and Their Development, and the Tasks Resulting From the Decisions of the 20th Congress CPSU"; G. D. Konyukh, "Basic Conditions for Mechanizing Calcium Carbide Production and the Tasks in This Field" and "Production of Calcium Carbide and Ways of Reducing Its Cost"; A. S. Mikulinskiy, Doctor of Technical Sciences, Professor of the Ural Affiliate of the Academy of Sciences USSR, "The Employment of Calcium Carbide for the Production of Light Metals by the Thermal Method"; and V. N. Krylov, Doctor of Technical Sciences, Professor of the Leningrad Technological Institute, "The Use of the Electrodes of Thermal Ore [rudnotermicheskaya] Furnaces."

Miscellaneous

NEW LEATHER SUBSTITUTES SOUGHT -- Moscow, Izvestiya, 26 Jan 58

The USSR chemical industry must meet current demands and begin the mass production of special plastics and new synthetic rubber needed in the development of all types of leather substitutes.

[The condensed text of this article on the expansion of the artificial leather industry in the USSR appears in The Current Digest of the Soviet Press, Vol 10, No 4, 5 March 1958, pp 34-35.]

II. PETROLEUM AND NATURAL GAS INDUSTRIES

USSR in General

Production

OIL PRODUCTION COMPARED -- Moscow, Vestnik Statistiki, No 1, Jan 58, p 93

The following table indicates crude oil production without gas in the US, Venezuela, and USSR, the world's three largest producers, and in certain other countries during stated years (in 1,000 tons):

	<u>1913</u>	<u>1929</u>	<u>1937</u>	<u>1950</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>
US	34,052	138,104	172,865	266,708	318,535	312,846	353,757	353,717
Venezuela	--	19,891	27,170	79,975	94,229	101,186	115,168	131,524
USSR	9,234	13,684	28,501	37,878	52,777	59,281	70,793	83,806
Rumania	1,848	4,827	6,594	5,047	--	--	10,555	10,920
Hungary	--	--	43	512	846	1,217	1,601	1,202
Bulgaria	--	--	--	--	--	5	150	247
Poland	--	--	--	162	189	184	180	184
China	--	--	320*	122**	622	789	966	1,163
Yugoslavia	--	--	110	110	172	216	257	294

* 1943 figure

** 1949 figure

USSR production in 1913 within present boundaries was 10,281,000 tons. According to preliminary figures, USSR production in 1957 has reached 98.3 million tons.

Baku, Bakinskiy Rabochiy, 14 Nov 57

The annual output of USSR crude oil output during the postwar period 1946-1955 rose nearly 50 million tons. This was 1.9 times the increase in the 20 years before the war.

From 1956 to 1960, annual extraction is scheduled to rise 64 million tons, or nearly double the increase made in the period 1951-1955 and 1.3 times that of the 10-year period from 1946 through 1955.

OIL INDUSTRY OPERATIONS FOR 1957 -- Moscow, Pravda, 27 Jan 58

The Central Statistical Administration of the Council of Ministers USSR reports that 1957 oil output reached 98.3 million tons, which was 117 percent of 1956 output.

The 1957 goal for the extraction of petroleum and the output of refined gasoline, kerosene, diesel fuel, lubricating oils, diesel, and transformer oils was surpassed.

The USSR reached a level of 20.2 billion cubic meters of gas, which was 148 percent of the 1956 output.

The oil industry expanded inner and outer contour water flooding, and new designs of turbodrills and new types of bits for use in hard rock were developed and are being introduced into the industry. However, losses of oil and gas in the industry are still heavy, and many of the oil fields failed to meet their goals for the mechanization of derrick assembly operations.

Moscow, Pravda, 28 Dec 57

The Central Statistical Administration announced that the industry extracted over one million tons of petroleum above its 1957 goal.

New Engineering

FLOATING FOUNDATION DESIGNED FOR OFFSHORE DRILLING -- Moscow, Na Stroitel'stve Truboprovodov, 11 Sep 57

Baku -- The Baku State Institute for Planning in the Offshore Oil Industry (Gipromorneft') has completed a rough drawing of the first floating foundation from which to drill offshore exploratory wells.

The foundation is comprised of two units: the floating hull and the above-water platform on which the drilling and auxiliary equipment is mounted.

The drawing provides for setting up the necessary living quarters on the float. The weight of the float is 400 tons, and it will be moved to the working spot by a tugboat. When it arrives at the designated spot, eight special pumps sealed in compartments of the float will give off a blast and the float will submerge to the sea bottom. The float can be lifted after drilling is finished, moved to another spot, and submerged again in 5 hours.

ENGINEERS DESIGN NEW-TYPE STORAGE TANK -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 13 Oct 57

Engineers of Giprosnets' (State Institute for Planning Special Projects in the Petroleum Industry) have designed a drip-type tank of 2,000-cubic-meter capacity. The construction of this type of tank requires more metal than the cylindrical type but the higher costs pay off shortly because the petroleum products do not evaporate. Nine of these tanks have already been built at the oil fields.

REMOTE CONTROL OF OIL WELLS -- Moscow, Izvestiya, 4 Jan 58

A remote-control system with few relays has been developed for operating deep-pumping wells. Known as the GM-4 system, it has considerable advantages over other systems of oil well operations. It is simple in design and, most important, does not require additional costly installations, since the available power, lighting, and telephone wires at an oil field can be used. In addition to controlling wells, the new system makes it possible to control such oil field installations as pumping and compressor stations. It is used very successfully in the Starogrozneft' Oil Field Administration in the Grozny area.

In 1958, almost all the oil wells at the Starogrozneft', Oktyabr'skneft', Gorskneft', and Gudermes oil field administrations will be placed under remote control.

Deposits

NEW OIL, GAS WELLS BROUGHT IN -- Moscow, Pravda, 27 Dec 57

Thirteen new oil deposits were opened in 1957 in the Bashkirskaya ASSR.

Ashkhabad, Turkmenskaya Iskra, 21 Dec 57

Ul'yanovsk -- The fact that there was petroleum in the nearby Tatarskaya ASSR and Kuybyshevskaya Oblast caused geologists to search for it in Ul'yanovskaya Oblast, and their efforts brought results in the southern part of the oblast, where heavy crude oil was found in three rayons. The area, depth, and reserves have been established.

Moscow, Komsomol'skaya Pravda, 5 Jan 58

Kazan' -- A new oil-bearing site has been uncovered near the village of Suliki in the southeastern part of the Tatarskaya ASSR. The test well produced flowing crude oil.

Moscow, Na Stroitel'stve Truboprovodov, 5 Jan 58

Buguruslan -- The Abdulino Drilling Office has been searching for oil and gas in the Orenburg Steppes. One of its crews struck oil at a depth of 1,800 meters near Ponomarevka. This crude contains a relatively high percentage of gasoline. Six more wells are being drilled in this vicinity.

Moscow, Na Stroitel'stve Truboprovodov, 8 Jan 58

Grun' -- A new oil deposit has been found near the village of Malaya Pavlovka in Sumskaya Oblast. The test well, drilled to a depth of 1,500 meters, proved to be a gusher and yielded a light crude oil with a high content of gasoline.

Moscow, Na Stroitel'stve Truboprovodov, 20 Sep 57

Ashkhabad -- A 2,400-meter gas well was brought in near Izgnat, southwest of Ashkhabad, where drilling of three wells was started at the end of 1956.

Gas Operations

GAS CONDENSATE DEPOSITS IMPORTANT TO NATIONAL ECONOMY -- Baku, Bakinskiy Rabochiy, 30 Nov 57

The gas condensate deposit opened in early 1955 at Karadag in the southwestern part of the Apsheron Peninsula was the beginning of a rapid expansion of the gas industry in Azerbaydzhan. This deposit has enormous reserves of gas and white crude oil; in 1958 is expected to yield more than 10 percent of the gas extracted throughout the USSR.

The discovery of this deposit made it possible to determine the prospects of a whole group of similar deposits on the northwestern side of the South Caspian depression from Karadag to Alyatskaya Gryada. The geological structure and the conditions under which pools are formed are similar in this zone and are likely to contain large pools of oil and gas.

The gas condensate deposits are new type of oil and gas pools. Both the yields and the pressure at the well head are higher. In contrast to the gas wells, the gas condensate wells yield high-calorie gas and white crude oil (condensate) which appears to be a mixture of gasoline, ligroin, and some kerosene. In some cases, the yield of condensate in the strata gas amounts to more than 100 tons a day, depending on the content of heavy hydrocarbons. In many of the wells at Karadag, the daily yields of condensate reach 100-150 tons, and the normal yield of gas is over 500,000 cubic meters per day.

The gas condensate deposits have peculiarities which make development highly effective and profitable. One of these is that the wells are worked during the entire period by the cheapest method, that is, flowing. Therefore, production costs are reduced considerably.

The gas condensate deposits are worked with the wells spaced much further apart than in oil deposits, which means far lower capital investments. For example, only 25 wells are required to work the horizons at Karadag. The development of a petroleum deposit of similar depth and area would require more than 150 wells whose construction would cost nearly six times as much.

Another factor favorable in working a gas condensate deposit is the high percentage of reserves which can be extracted without pressuring. More than 90 percent of the available gas and up to 50 percent of the potential crude oil can be withdrawn without pressuring. In the case of petroleum deposits, only 40 percent of the petroleum can be extracted without pressuring.

Depth is important in gas condensate deposits. The deeper the gas condensate pools lie, the greater the pressure and the larger the reserves of gas and condensate per unit of area. For example, the gas and condensate reserves of a gas condensate stratum lying at a depth of 4,000 meters are twice those of a stratum at a depth of 2,200 meters.

The profitableness of working the gas condensate deposits is demonstrated by the operations of the Karadag deposit. The first well was brought in from horizon VII in January 1955. Although the pools lie at depths of 4,000 meters, it has been possible since then to explore the whole seam and put it into service. The seam is basically worked by test wells. To develop a similar petroleum deposit would require over 100 developmental wells, the drilling of which would take at least 10 years.

The great yields from the wells cover their construction costs within 3-4 months. The profits realized from the gas and condensate extracted during the past 2.5 years have more than paid for the cost of deep exploration.

LONG-RANGE PROGRAM FOR GAS INDUSTRY PLANNED -- Moscow, Stroitel'stvo Predpriyatiy Neftyanovy Promyshlennosti, No 12, Dec 57, pp 27-28

The Main Administration of Gas Industry USSR and the Department of the Petroleum and Gas Industry of Gosplan USSR have developed and expect to present to Gosplan USSR a plan for expanding the USSR gas industry between 1959 and 1965 and the principal tasks to be involved in extraction and production in the following 10 years.

The plan calls for definite measures regarding the expansion of prospecting and exploration, extraction of natural gas, production of synthetic gas, increased construction of gas lines, and the output of pipe and equipment. In addition, the plan calls for increasing the supply of gas to more cities in the USSR.

If these measures are accomplished, the USSR will, within 15 years, increase its output of gas by extraction and production to 13-15 times the present level and reach 270-320 billion cubic meters a year. The results will also increase the ratio of gas in the fuel balance to 22 percent in 1965. The accomplishment of this program will also have far-reaching results on fuel saving costs, since the cost of extracting natural gas is approximately 8.3 percent that of coal and about 28.5 percent that of petroleum.

Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 8 Dec 57

The USSR gas industry plans to lay some 40,000 kilometers of main trunk gas lines between 1959 and 1965.

INCREASED GAS SUPPLY TO MOSCOW -- Moscow, Sovetskaya Rossiya, 4 Jan 58

Extraction of natural gas in the RSFSR now is 26 times that of 1940. Natural and petroleum gas is extracted at 129 sites in this republic.

Gas is now supplied to 520,000 apartments (compared with 2,700 apartments in 1913), about 900 dining establishments, and hundreds of educational and medical institutions in Moscow.

Ukraine

REPORTS INDICATE EMPHASIS GIVEN TO GAS -- Moscow, Pravda, 25 Dec 57

Extraction and consumption of natural gas in the Ukraine in 1957 will exceed 6 billion cubic meters, or 12 times as much as before the war.

During the last 10 years, more than 30 cities, among them Kiev Khar'kov, Dnepropetrovsk, Poltava, and Zhitomir, have been supplied with gas.

Crude oil production has nearly tripled since the end of World War II.

Moscow, Na Stroitel'stve Truboprovodov, 10 Jan 58

L'vov -- The previous belief that there was no gas in L'vovskaya Oblast has been disproved now that operations have started at the gas deposit at Svidnik. Cheap fuel is now being extracted in several locations in the Carpathian foothills.

Kiev, Pravda Ukrainy, 4 Jan 58

Gas is produced in the Ukraine at Ugersk, Bil'che Volitsa, Rudki, Dashava, and Opara in Grogobychskaya Oblast and at Kadobny in Stanislavskaya Oblast. It will soon be produced at the newly opened deposits at Kosov, Dobryanskoye, and Parishchevka in Stanislavskaya Oblast. Construction of gas lines from Kosov to Chernovtsy by way of Kutu, from Rudki to Sambor, and from Ugersk to Khodorov by way of Zhidachov is nearing completion.

Ural-Volga Region

OIL OUTPUT IN TATARIYA RISES 5 MILLION TONS -- Moscow, Trud, 28 Dec 57

Oil output in 1957 in the Tatarskaya ASSR was 5 million tons higher than in 1956. The republic still continues to lead the Bashkirskaya ASSR and Kuybyshevskaya Oblast in extraction.

Central Asia

KAZAKHSTANNEFT' ASSOCIATION CHIEF IDENTIFIED -- Alma Ata, Kazakhstanskaya Pravda, 31 Dec 57

D. Dosmukhambetov is chief of the Kazakhstanneft' Association.

[Comment: Dosmukhambetov was identified as chief, but no reference was made to a change. S. Utebayev was identified in this capacity in Kazakhstanskaya Pravda of 24 June 1954 and Neftyanoye Khozyaystvo, No 1, January 1957.]

TURKMEN MEETS 1957 GOAL -- Ashkhabad, Turkmenskaya Iskra, 20 Dec 57

Nebit-Dag -- The Turkmenneft' Association met its 1957 petroleum production goal ahead of schedule.

Azerbaydzhan

NEW OIL FIELD ADMINISTRATION IDENTIFIED -- Moscow, Neftyanik, No 12, Dec 57, p 7

The Capital Well Repair Division of the Lokbatanneft' Oil Field Administration is endeavoring to fulfill its goal for capital repairs.

[Comment: This is the first time that this field administration has been identified. It probably replaced the Molotovneft' Oil Field Administration, which Bakinskiy Rabochiy, 5 January 1956, reported as having operated in Lokbatan, a settlement in Molotovskiy Rayon of Baku.

Prosvyshlenno-Ekonomicheskaya Gazeta, 24 August 1956, reported that Karadag Gas Field No 9 was organized as part of the Molotovneft' Oil Field Administration but separate from Oil Field No 9 of Molotovneft'.

Subsequently, a Karadagneft' Oil Field Administration with oil fields No 3, 4, 6, and 9 was identified in Bakinskiy Rabochiy, 30 July 1957. Molotovneft' was last identified in Bakinskiy Rabochiy of 23 May 1957.]

1957 PRODUCTION FIGURES FOR PETROLEUM, GAS REPORTED -- Baku, Bakinskiy Rabochiy, 29 Dec 57

Azerbaijdzhan crude oil production in 1957 will be 390,000 tons higher than in 1956. Of the 1957 output, 2,656,000 tons resulted from pressure maintenance and the use of secondary recovery methods.

Gas extraction in 1957 will be 1.3 billion cubic meters more than in 1956. The Ministry of Petroleum Industry Azerbaijdzhan SSR surpassed its 1957 goal for gas extraction by more than 133 million cubic meters.

Baku, Bakinskiy Rabochiy, 27 Dec 57

The Ministry of Petroleum Industry Azerbaijdzhan SSR extracted 64 percent more gas in 1957 than in 1956.

Daily extraction at the ministry's Karadagneft' Oil Field Administration increased by 3.5 million cubic meters. Extraction in this field administration in 1957 was 2.4 times that of 1956.

DAILY GAS EXTRACTION IN AZERBAIDZHAN AHEAD OF 1960 GOAL -- Baku, Azerbaijdzhanskoye Neftyanoye Khozyaystvo, No 11, Nov 57, pp 25-27

Sixty of Azerbaijdzhan's oil fields are sealed off to prevent the loss of crude oil, gas, and gasoline. The gathering and transport of petroleum gas at the fields have been mechanized. The rated capacity of the gas compressor installations in Azerbaijdzhan has reached 1.8 billion cubic meters per year. Many gas-gathering and distributing facilities, major gas pipelines, and offsets totaling about 2,000 kilometers have been constructed and put into service.

Gas extraction in 1957 rose to 3.5 times that of 1946. Daily extraction in the second half of 1957 has already passed the daily level set for 1960.

Large-scale deep exploration resulted in the discovery and putting on stream of a large gas deposit at Duvanny and a very large gas-condensate deposit at Karadag. With the discovery of these deposits, gas reserves in Azerbaijdzhan have become ten times as large as 3 years ago. Reserves have increased especially in the southwestern part of the Apsheron Peninsula.

Conversion from liquid fuel to gas in Baku and Sumgait made it possible during the past 3 years to release 2.5 million tons of liquid fuel to the national economy for other purposes.

Since the second part of 1954, the gas fields at Duvanny and Karadag were built up; major gas lines were laid from Duvanny to Baku, Karadag to Belyy Gorod, and Karadag to Sumgait; a gas line was laid around Baku; and a line was laid from Ostrov Peschanny to Karachukhur. The oil refineries, machine building plants, Sumgait Electric Power Station, and several villages and populated points have been supplied with gas.

RATIO OF FLOWING WELLS INCREASES BUT DEEP PUMPERS STILL IN MAJORITY --
Baku, Azerbaydzhanskoye Neftyanoye Khozyaystvo, No 11, Nov 57, pp 20-21

Deep-well pumping is still the principal means of producing oil at the Baku oil fields. Deep-well pumps are installed in 96 percent of the wells and account for more than 50 percent of the extraction.

The percentage of flowing oil has been constantly rising in the over-all total. During the last few years it rose as follows (in percent):

1954	14.1
1955	18.1
1956	28.0
1957	29.2

The ratio of oil from compressor wells now is 24 percent and it is likely that this percentage will decline further. A total of 958 compressor wells, or more than 90 percent, operate automatically.

During recent years, the service life of deep-well pumps has hardly changed from 63 days. In some sectors, there are cases where the pumps fail to operate more than 12-15 or even 5-6 days. In the wells equipped with electric rather than piston-type pumps, the yields have increased 20 percent and the period between repairs has been prolonged 250-300 percent. The electric pumps are particularly advantageous in the off-shore fields, where it is difficult to install pumping jacks because of the lack of space on the scaffolds and where the construction of compressor stations would be costly.

The number of underground repair jobs and the time spent on them have increased to 201,136 jobs requiring 3,101,502 hours in 1956 from 169,987 jobs requiring 2,689,000 hours in 1950. The average time spent

on a single job has hardly changed from the 15.8 hours in 1950 and 15.5 hours in 1956. Although the time spent on a repair job has hardly changed throughout the industry, mainly because of flushing and cleaning the wells, it has been declining in particular instances. For example, a pump change in 1956 required 11.5 hours, as compared with 15 hours in 1950. The reduction has been due to improvements and mechanization of underground repairs. In 1956, more than twice as many wells were repaired by new technology as in 1954. The flushing and cleaning of core from the wells consume 42.5 percent of the time spent on underground repairs.

A great achievement in capital repairs has been the acquisition of know-how and the introduction of reborings second holes to restore some difficult wells. Since 1953, a total of 560 wells have been restored by this method and they have accounted for 757,200 tons of petroleum.

The time spent to seal off the flow of stope water consumes 38 percent of the period spent on capital repairs. There have recently been some improvements in this work in both the high- and low-absorption wells; cementing of extra-deep wells with excessive stope temperatures has been mastered, and the cement solution is forced into the strata at a slower rate.

A water-sand mixture, gel cement, or a cement with aluminum powder are used to reduce the intake of the strata of the high-absorption wells. Experimental tests with a petroleum base cement to which superficially activated substances were added were performed in 150 wells in 1956 and 250 wells in 9 months of 1957. The results were favorable.

III. FERROUS METALLURGY

Production

FERROUS METALLURGY COMPLETES 1957 PLAN -- Moscow, Pravda, 1 Jan 58

The Central Statistical Administration under the Council of Ministers USSR has reported that workers in the ferrous metallurgical industry have successfully completed the 1957 plan for rolled stock. It has stated further that, during 1957, the workers produced 40 million tons of rolled stock, or 6 percent more than in 1956.

USSR 1957 FERROUS PRODUCTS OUTPUT -- Moscow, Trud, 28 Dec 57

During 1957, the USSR will produce 37 million tons of pig iron and 51 million tons of steel. Miners of the country will extract 84 million tons of iron ore.

1957 ACHIEVEMENTS OF UKRAINIAN METALLURGICAL INDUSTRY -- Moscow, Pravda, 25 Dec 57

In 1957, the metallurgical industry of the Ukrainian SSR will produce almost 18.5 million tons of pig iron, 20 million tons of steel, and 16 million tons of rolled stock. The republic will outproduce a number of capitalist countries in metallurgical output.

It will be necessary to increase extraction of iron and manganese ore to more than four times the present level, to construct large ore-concentrating combines, and to develop the extraction of ore by the open-pit method in order to raise iron ore extraction to 130-150 million tons in the Ukrainian SSR in the next 15 years, as against 44 million tons in 1957.

FERROUS METALLURGICAL PLANS IN UKRAINIAN SSR FOR 1958 -- Moscow, Izvestiya, 21 Dec 57

In 1958, the Ukrainian SSR plans to smelt 20.1 million tons of pig iron, or 1.6 million more than in 1957, and to process 21.2 million tons of steel and 17.2 million tons of rolled products.

UKRAINIAN PROPORTION OF 1958 FERROUS PRODUCTS OUTPUT -- Kiev, Pravda
Ukrainy, 21 Dec 57

In 1958, the Ukrainian SSR will produce 48 percent of the pig iron, 37.7 percent of the steel, 38.8 percent of the rolled stock, and 55.9 percent of the iron ore produced or extracted in the USSR.

MOSCOW METALLURGISTS FULFILL PLAN FOR STEEL -- Moscow, Trud, 24 Dec 57

Moscow metallurgists are achieving high productivity. Since the beginning of 1957, they have delivered above the plan more than 8,000 tons of steel and 1,700 tons of finished rolled products. The yearly plan for gross production was fulfilled by 7 December 1957.

PRODUCTION PROBLEMS FACING FERROUS METALLURGICAL INDUSTRY -- Moscow, Stal',
No 1, Jan 58, pp 1-3

According to preliminary data, the smelting of pig iron in the USSR in 1957 rose to 37 million tons, an increase of 1.3 million tons, or 3.6 percent. During the same period, the smelting of steel rose to 51 million tons, an increase of 2.4 million tons, or 5 percent, and the production of rolled products rose to 40.1 million tons, an increase of 2.3 million tons, or 6.1 percent.

However, some sovnarkhozes did not fulfill the year plan, particularly the Chelyabinskiy Sovnarkhoz, which failed to fulfill the plan for pig iron, steel, and rolled products, and the Sverdlovskiy Sovnarkhoz, which lagged in its pig iron production.

The Azovstal', Makeyevka, Stalinskiy, Alchevskiy, Kramatorsk, and Ashinskiy metallurgical enterprises as well as some others failed to fulfill the 1957 plan for pig iron and steel because of imperfections in the field of technology, organization of production, and treatment and repair of equipment.

Many agglomerating factories did not achieve the increase in the basicity of the fluxed agglomerate provided for in the plan. The basicity of agglomerates was particularly low in the case of the Bakal Mine Administration (45 percent), the Krivoy Rog Yuzhnyy Ore-Concentrating Combine (38 percent), the Yenakiyev Plant (74 percent), and the Krivoy Rog Metallurgical Plant (80 percent). The basicity of the agglomerate was also unsatisfactory in the Zaporozhstal' Plant and in the Plant imeni Dzerzhinsk. Because of the low basicity of the agglomerate, a considerable amount of raw limestone is added to the blast furnace charge in several plants and there is a corresponding increase in the consumption of coke and a decrease in the productivity of the blast furnaces.

Considerable losses of pig iron were also caused by above-plan work stoppages for repairs in the case of some blast furnaces (62 days instead of 40 in the Alchevskiy Plant, 15 days instead of 12.5 in the Novo-Lipetsk Plant), extra plan repairs of furnaces (particularly in the Nizhniy-Tagil Combine), and lengthy operation of the furnaces with reduced productivity (for example, in the Chelyabinsk Plant), because of emergency repair of the blast heater resulting from the poor quality of the brick in the brickwork.

The iron content of the ore part of the charge was lowered in a number of plants because of unsatisfactory organization in the mining and concentrating of the iron ores. In Bakal ore, supplied to the Chelyabinsk Metallurgical Plant, the iron content dropped from 46.4 percent in 1956 to 44 percent during the first 9 months of 1957, and the ore of the Nizhniy-Tagil Combine showed a corresponding drop from 51.8 percent to 50.3 percent. The iron content of ores in the Krivoy Rog Basin dropped from 55.4 percent in the first half of 1957 to 54.47 percent in the second half.

The ash content of coke in eastern plants rose an average of 0.67 percent in the second half of 1957, which also impaired the work indexes of the blast furnaces.

The 1957 plan for capital construction was not fulfilled by the ferrous metallurgical industry. The delay in utilizing new capacities, particularly in the iron-ore industry, is slowing down the rate of growth in the ferrous metallurgical industry. In 1957, 3 blast furnaces, 7 open-hearth furnaces, 5 rolling mills, 5 coke batteries, 7 agglomeration belts, and several mines and open pits for the extraction of iron ore were put in operation and this relieved the situation to a certain degree.

The 1958 plan provides for the smelting of 39.1 million tons of pig iron and 53.6 million tons of steel, and the production of 41.7 million tons of rolled products. This will mean a 2.1-million-ton increase in pig iron over 1957, a 2.6-million-ton increase in steel, and a 1.6-million-ton increase in rolled products.

Extraction of iron ore is to increase to 87 million tons (an increase of 2.9 million tons), and the production of coke to 50.6 million tons (an increase of 2 million tons).

To improve further the quality of the raw material, the production of agglomerate should be increased from 44.9 million tons in 1957 to 49.5 million tons in 1958, with a considerable increase in the basicity of the agglomerate in a number of plants.

To improve the smelting of pig iron for steel making, organization of the production of ferrosilicon with 18 percent silicon is planned in electric furnaces.

The successful execution of measures which have been planned will increase the amount of steel removed per square meter of open-hearth furnace bottom to 7.12 tons per 24 hours in 1958.

Smelting and rolling of low-alloy steel will increase to 1,385,000 tons of rolled products in 1958, as against 800,000 tons in 1957.

Capital investment in the ferrous metallurgical industry will increase to 12.1 billion rubles in 1958, as against 8.8 billion rubles in 1957, to ensure a vigorous growth of the industry. Seven high-capacity blast furnaces with a volume up to 1,719 cubic meters will be put in operation, iron ore enterprises with 10 million tons' capacity will be developed, and ten agglomeration machines will start operating.

Capital investments in the iron ore base will be increased 73.4 percent and in the construction of metallurgical plants almost 42 percent.

INCREASED PRODUCTION REQUIRES STEPPED UP CONSTRUCTION -- Moscow, Gornyy Zhurnal, No 1, Jan 58, pp 3-5

The USSR has the facilities for increasing the annual output of pig iron to 75-85 million tons and of steel to 100-120 million tons during the next 15 years. To do this it will be necessary to accelerate the development of the iron ore base. During these 15 years, extraction of iron ore must be raised to 250-300 million tons per year, that is, an increase of 200-250 percent.

The former ministries of ferrous metallurgy USSR and Ukrainian SSR and also the former Ministry of Construction of Enterprises of the Metallurgical and Chemical Industry failed consistently to fulfill the plan for construction of mines and for putting into operation new facilities. There are thoroughly explored reserves of iron ore in the region of the Kursk Magnetic Anomaly, the Urals, Kazakhstan, and West and East Siberia, but exploitation of these deposits has proceeded slowly during the past years. For example, the 1956 plan for construction and putting into operation of new facilities was fulfilled only a little more than half.

Until recently, the sinking of shafts in iron ore mines was entirely unsatisfactory. In the Donets Coal Basin the speed of sinking some shafts exceeded 100-150 meters per month, and in March 1957, a world record was set with 241.1 meters of completed shaft per month in sinking a ventilation shaft in the Butovskaya-Glubokaya Mine, a mine with a large cross section. The average speed for the Stalin Mine-Sinking Trust exceeded 50-60 meters per month. However, in the neighboring Krivoy Rog Basin, the average speed of sinking shafts remained only one tenth to one fifth as high.

In 1958, the volume of capital investment in enterprises and structures of the iron-ore industry will increase to 1.7 times that of 1957. In the Krivoy Rog Basin alone, where very large enterprises for the extraction of iron quartzite by the open-pit method (Novo-Krivorozhskiy, Yuzhnyy No 2, and the Central Mining-Ore-Dressing Combines) will be put in operation, it will be necessary to complete construction and assembly work costing 1,210,000,000 rubles, including 460 million rubles for the Sokolovsko-Sarbay Combine and 280 million rubles for the KMA (Kursk Magnetic Anomaly).

Open-pit operations in the Lebedinskoye, Yuzhno-Lebedinskoye, Stoylinskoye, Mikhaylovskoye, and Kurbatovskoye deposits will permit a yearly output of approximately 20 million tons of rich ore in 10-12 years. During the next 7-8 years, up to 40-45 million tons of iron ore can be supplied by mining enterprises of Kazakhstan: the Sokolovsko-Sarbay and Kacharskiy combines in the Kustanayskaya Oblast, the Atasuyskiy Mine in the Karagandinskaya Oblast, and the Atansorskiy Mine in Kokchetavskaya Oblast. In addition to enterprises operating in the Urals, these mines will supply the Karaganda Plant, which is under construction, as well as other plants, with raw materials.

Construction trusts and combines in existence in the iron ore basins are not strong enough and do not have at their disposal the necessary personnel and techniques to increase the volume of construction. It would be expedient either to create strong construction organizations in areas where large mines are being constructed or to transfer to these sites large construction organizations already in existence. This will permit ending the lag in exploiting the deposits of the Kursk Magnetic Anomaly and will facilitate putting in operation the Lebedinskiy Pit, with an output of 1.5 million tons of ore in 1959 and an increase in capacity of another 1.5 million tons in 1960. In 1960, it is planned to put in operation the Mikhaylovskiy Pit with an output of 2.5 million tons per year.

The task set by the CPSU of raising the output of iron ore to 300 million tons in the next 15 years should be fulfilled.

Technology

USE OF OXYGEN IN STEEL SMELTING TO INCREASE -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 5 Jan 58

In conformance with directives of the 20th Congress of the CPSU, enterprises of the ferrous metallurgical industry have pledged that they will ensure smelting with the use of oxygen for approximately 40 percent of all the steel produced in the country in 1960. Workers of the Chelyabinsk Metallurgical Plant are successfully fulfilling this assignment.

Open-Hearth shop No 2 of the plant has already completely converted to the use of oxygen in smelting metals and, by the end of 1957, had delivered nearly 10,000 tons of high-grade steel above the plan.

DECREASE OF STEEL WASTAGE IN ROLLING OPERATIONS -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 15 Dec 57

Up to now, 14-25 percent of ferrous metal has been wasted in rolling operations in the USSR. This results mainly from the pipe in the head of the ingot. Different methods of coping with this waste are applied in different places. At the Izhevskiy Plant, for example, the method of lengthening the ingot has been widely adopted. The essence of this is that ingots of one and the same weight are increased in length and decreased in diameter.

Industrial checking of ingots of different shapes and weighing 1.5-4 tons has indicated that the best results are obtained with the ratio of the length to the diameter of 3.5 to 4. Adoption of such a relationship in 3-ton ingots has reduced the waste from 18-22 tons to 14-16 tons and resulted in a saving of more than 3 million rubles per year.

The advantage of the lengthened ingot is that it takes considerably less time to warm it up and the productivity of the blooming mill is increased.

Further decrease in the waste of the ingot by increasing the ratio of the length to the diameter is accompanied by great difficulties. Although, in ingots which weigh 5.7 tons and are 4 meters in length and 530 millimeters in diameter it is still possible to reduce the waste to 12 percent, operating steel-smelting shops have not succeeded in casting them because of the complexity of assembling the channel and of pouring the steel.

Workers of the Izhevskiy Plant used induction current for heating of the ingot. A generator with a capacity of 500 kilowatts was used with a frequency of 2,600 hertz and a voltage of 750 volts. More than 20,000 tons of steel of different types have already been cast by the method of induction heating. It has been determined that the volume of an ingot with a pipe is 5 percent less, regardless of the chemical composition. Analysis of the chemical heterogeneity, the mechanical properties, and the impurities of steel with nonmetallic impurities also points to the good quality of the ingots.

For heating ingots weighing 3 tons, a maximum of 14 kilowatts per ton is required but 14-18 kilowatt-hours of electric power are consumed. Despite the additional outlay of electric power, the production costs of steel have been considerably reduced.

Now a plan for an industrial installation has been drawn up for induction heating of ingots which calls for a yearly capacity of 50,000-80,000 tons of steel.

NEW METHOD DEvised FOR PRODUCING PIPE -- Moscow, Trud, 22 Dec 57

Engineers of the Karaganda State Institute for Planning Mines have devised a simple and inexpensive method for producing pipes for the protection of high-voltage electric circuits with the help of a deep vibrator. For this purpose an aggregate consisting of two vertical boring and turning machines was prepared. Each of these had 16 "ribs" (ferma) located vertically. A vibrating rod extended through the rib at the bottom and the cement was supplied from above. The head of the vibrator, making 10,000 revolutions per minute, formed the pipe and at the same time compacted the cement.

This method was devised to replace the method of producing pipes by centrifugal machines, which are expensive apparatuses and require a great output of labor. The centrifugal-machine method consumed 5 times as much electricity, was 2.5 times as laborious, and involved production costs 1.5 times as high as the new method.

The Karagandinskiy Sovnarkhoz has decided to construct three of the new installations for producing pipe.

High-Grade Steel

NEW SHOP FOR PRODUCING HIGH-GRADE STEELS OPENED -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 27 Dec 57

The Zlatoust Metallurgical Plant has put in operation a large new shop for the production of calibrated, polished, and tool steel. The gigantic light framework of the shop covers an area of more than 2 hectares. It is equipped with mazut and electric furnaces for hot working of metals, as well as with charging machines, pickling baths, various machines to produce tool steel, and other mechanisms. The new aggregates are considerably more productive than the aggregates in the old heat-calibrating shop of the plant.

The new shop will permit the Zlatoust metallurgists to increase the production of calibrated, polished, and tool steel approximately 40 percent and to double the heat treatment of hot-rolled metal.

Deposits, Mines, Plants

EXPLOITATION OF RICH IRON ORE DEPOSIT STARTED -- Riga, Sovetskaya Latvija, 28 Dec 57

Exploitation of the iron ore deposit in Mikhaylovskiy Rayon, 90 kilometers from Kursk, was started in the third quarter of 1957. This is one of the deposits of the Kursk Magnetic Anomaly with the best prospects for development. The ore here contains an average of 58.5 percent of iron and is located at such a shallow depth that it can be mined by the open-pit method.

Ore from the Mikhaylovskoye deposit will be the least expensive in the USSR. The explored reserves of this deposit, together with those of the recently opened Kurbakinskoye deposit, have been estimated at 520 million tons.

MINE CONSTRUCTION STARTED AT RICH DEPOSIT -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 15 Dec 57

Construction of the Sarbay Mine has been started in Kazakhstan. More than 70,000 cubic meters of overburden has been removed. Recently, geologists have made a new survey of the Sarbay deposit and have estimated that more than 900 million tons of high-grade magnetic ore is contained in it.

MOSCOW PLANT DELIVERS ABOVE-PLAN STEEL -- Moscow, Moskovskaya Pravda, 18 Dec 57

Metallurgists of the Serp i Molot Metallurgical Plant have already delivered nearly 10,000 tons of steel, finished rolled goods, and other products above their quota.

NEW CONVERTER SHOP STARTS OPERATIONS -- Kiev, Pravda Ukrainy, 26 Dec 57

On 25 December the heat testing of the first level of the converter shop recently built at the "Krivorozhstal'" Plant was started. The shift of Ustim Bykovskiy produced the first melt of steel in 18 hours and 40 minutes.

The new converter shop is the largest in the Soviet Union and in Europe. Two of the converters have already gone into operation and two others will be on stream before long.

KRIVOROZHSTAL' PLANT HAS UP-TO-DATE CONVERTER SHOP -- Minsk, Sovetskaya Belorussiya, 27 Dec 57

The Krivoy Rog Converter Shop was constructed with the benefit of the most modern achievements of steel-smelting techniques. The shop is equipped with 1,300-ton mixers to neutralize molten pig iron and 35-ton converters. All processes are controlled from a central panel.

The numerous buildings of the converter shop take up an area almost 2 kilometers in length.

TRUBOSTAL' PLANT LAGS -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 27 Dec 57

Every year, the demand for welded pipes produced by the Leningrad Trubostal' Plant increases. At present, 70 percent of the plant production is destined for consumers far beyond the bounds of the Leningrad Economic Region.

During the first 6 months of 1957, the Trubostal' Plant failed to fulfill the plan both for commodity production and gross production. It failed to deliver to the country 203 tons of ferrous pipes and 235 tons of galvanized pipes, and there were more than 235 tons of rejected products. The situation did not improve in the second half of 1957. In the pipe-welding shop alone there were more than 100 tons of rejected products in one month only. In 10 months, the Trubostal' Plant consumed an excess of 549 tons of coal and 113,000 kilowatt-hours of electricity.

VYKSA PLANT INCREASES OUTPUT -- Moscow, Pravda, 20 Dec 57

The Vyksa Metallurgical Plant is one of the leading enterprises of the USSR. By modernizing its equipment and mechanizing its main and auxiliary shops the plant, during the 10 years after World War II, has increased its output of metal 150 percent.

The well-being of the workers has been improved. During 1957 alone, 5,000 square meters of living space has been put in use.

FERROALLOYS PLANT EXCEEDS 1957 PLAN -- Alma-Ata, Kazakhstanskaya Pravda, 25 Dec. 57

As of 25 December 1957, the Aktyubinsk Ferroalloys Plant had already exceeded the annual plan for the smelting of metal. The level of production rose 11 percent over 1956. The workers of furnaces No 2, 6, 12, and 13 were already producing melts for the 1958 program.

AZOVSTAL' PLANT TO HAVE NEW BLAST FURNACE -- Moscow, Komsomol'skaya Pravda, 24 Dec 57

During 1958, a new blast furnace will be put in operation in the Azovstal' Plant, the huge metallurgical plant of the south. The assembly of this furnace has already begun.

IV. NONFERROUS METALLURGY

Production

NONFERROUS METALLURGY COMPLETES 1957 PLAN -- Moscow, Pravda, 28 Dec 57

The Central Statistical Administration under the Council of Ministers USSR has reported that workers in the nonferrous metallurgical industry have completed, ahead of schedule, the 1957 plan for the production of the most important types of nonferrous metals. It has stated further that a considerable amount of above-plan aluminum, magnesium, lead, zinc, tin, and other types of nonferrous metals will be produced.

KAZAKH SSR PLANS INCREASE IN METAL OUTPUT -- Alma-Ata, Kazakhstanskaya Pravda, 25 Dec 57

An increase of 3.3 percent for nonferrous metallurgy and 11 percent for ferrous metallurgy is planned for the Kazakh SSR in 1958. The production of lead, the extraction of copper ore, and the smelting of refined copper and steel will be increased 3-9 percent and iron ore extraction 63 percent.

Technology

USE OF NEW REDUCTION AGENT DECREASES WASTE -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 Dec 57

Industrial enterprises of the USSR do a tremendous amount of nonferrous casting every year; for example, enterprises of the Ministry of Railways yearly cast bronze spare parts totaling several tens of thousands of tons in weight and valued at several hundred million rubles. At the same time, these plants incur losses resulting from flaws in the nonferrous castings which amount to 3-4 percent and represent a cash loss of tens of millions of rubles per year.

Analysis indicates that 60-70 percent of the total flaws in castings result from the occurrence of gaseous blisters and porosity in the castings. The chief reason for the flaws seems to be the faulty method of deoxidizing nonferrous metals which is employed by the USSR in the production of castings. This method requires the use of an alloy, copper phosphide, (GOST 4515-48) with a phosphorus content of 7-8.5 percent. However, this copper is not a strong reducing agent and it does not ensure the complete removal of oxides and gases from the smelted nonferrous metals.

A zinc phosphide agent has been widely used abroad for the past 10-15 years and has resulted in a bronze which has met technical requirements. A zinc phosphide agent of the "metallofos" type is made up of 76 percent zinc and 20 percent red phosphorus mixed in the form of powder with 4 percent of resinous binder and pressed to form round briquettes 50 grams in weight. Every four briquettes are wrapped in foil and kept in a dry place. The amount of the reducing agent is 0.2 percent of the weight of the molten bronze.

The high quality of deoxidation of the metal by the zinc phosphide reduction agent is explained in the first place by the lower temperature at which the zinc is smelted (420 degrees, as against 1,080 degrees in the smelting of red copper) and the powder form of the zinc and phosphorus components of the previously pressed reduction agent. Under these conditions the phosphorus and zinc melt quickly, penetrate the entire layer of metal, and completely remove from it oxides and gases.

The mass production cost of the zinc phosphide reduction agent will be considerably less than the cost of copper phosphide, since zinc costs only half as much as red copper. The relative consumption of expensive red phosphorus per ton of molten metal will be only one half as much for the new agent as for copper phosphide.

In view of the indisputable advantage of the zinc phosphide reduction agent, the Ministry of Railways was requested to organize the production of this reduction agent and to use it extensively in plants of the ministry in place of copper phosphide. Up to now the matter has not been favorably acted upon. However, interests of the national economy require consideration of the use of this new agent, which would contribute to a saving of tens of millions of rubles in state funds, resulting from the great decrease in flaws in nonferrous metal castings.

TECHNOLOGY IMPROVED IN ALAVERDI COMBINE -- Yerevan, Kommunist, 27 Dec 57

The Alaverdi Copper-Chemical Combine issues eight types of products. Workers of the enterprise completed the year plan ahead of schedule and, since the beginning of 1957, have put out a considerable amount of above-plan production. The introduction into production of modern techniques and outstanding technology contributed in no small measure to the success which they achieved.

Here the heat system of the converter process has been automatized. This has helped improve the technological process and has decreased the length of smelting 2-2 1/2 hours. A machine for unloading the friable materials and a number of other mechanical devices have been installed in the combine.

More operations now take place in the converter shop. An additional exhaust fan has been installed here in order to utilize better the gas which is released during the smelting of copper. This permits increase in the output of sulfuric acid.

Formerly, handling of slag in the "waterjacket shop" (vaterzhaketnyy tsekh) was done manually. Now this laborious process is mechanized. With complete mechanization in the section, up to 20 workers will be freed.

Deposits, Mines, Plants

TITANIUM-ZIRCONIUM DEPOSIT SURVEYED -- Moscow, Vechernyaya Moskva, 17 Dec 57

An expedition of the Kiev Geological Administration has completed surveying a large deposit of titanium-zirconium on the right bank of the Dnepr, in the basin of one of its tributaries, the Samotkan' River. The area of the deposit is estimated at tens of square kilometers and its reserves exceed all known deposits of this valuable raw material in the USSR.

Titanium is called the element of the future. It is widely used for smelting heat-resistant steels and, in particular, for highly durable alloys.

In the Samotkan' deposit there have also been found industrial concentrations of scattered elements and valuable by-product minerals which are used in semiconductor techniques in the abrasive, chemical, refractory, and other branches of industry.

The detailed exploration conducted by Ukrainian geologists has shown that the depth of the titanium-zirconium ores and the other useful minerals in this area does not exceed 20-40 meters. This permits them to be mined by the open-pit method, using powerful modern excavators.

The Dnepropetrovskiy Sovnarkhoz has approved a plan for the construction of the Verkhne-Dnepr Concentration Combine, drawn up by the State Institute for Planning Enterprises of the Nonferrous Metallurgical Industry. It will have at its disposal a large pit and a concentrating plant using the most modern techniques.

ZIRCON AND ILMENITE DEPOSITS IN TOMSKAYA OBLAST -- Moscow, Moskovskaya Pravda, 27 Dec 57

Geologists have discovered in Tomskaya Oblast a large new area of useful minerals -- deposits of zircon and ilmenite of industrial importance. Extensive exploitation of the zircon and ilmenite will produce important raw materials for industry, particularly for obtaining zirconium and titanium.

Alloys of titanium are considerably lighter and stronger than iron and are used in the aviation and shipbuilding industries. Zirconium is necessary for modern technology, in the production of porcelain, glass, and ceramics, among other things. It is an advantage that these large new deposits of zircon and ilmenite have been found in an inhabited area of the east and that they are located almost at the surface of the earth so that exploitation of them requires neither a long time nor a great outlay of cash.

RICH NEW MINERAL DEPOSITS DISCOVERED IN EAST -- Prague, Obrana Lidu, 20 Dec 57

Soviet geologists have recently discovered enormous deposits of raw materials, which were unknown at the time of the 20th Congress of the CPSU. They are so large that they defy the imagination and immediately place the USSR in the world forefront in reserves of iron ore, manganese, coal, copper, bauxite, nickel, tungsten, lead, quicksilver, mica, and potassium salts.

Most of the newly discovered deposits are in the eastern territories. New mines must be opened up and new combines constructed as soon as possible. The 3 remaining years of the Sixth Five-Year Plan will not suffice for this. Economists and technicians have estimated that 7 years will be required to carry this out. Therefore, a 7-year plan has been proposed.

MANGANESE AND BAUXITE DEPOSITS EXPLORED -- Moscow, Izvestiya, 24 Dec 57

Manganese ores are being exploited along the Dnepr River in the area of Nikopol'. At present, geologists are exploring similar ores in the adjacent Bol'she-Tokmakskiy Rayon and extensive bauxite deposits have been opened up in Shirokovskiy Rayon of Dnepropetrovskaya Oblast.

NEW MANGANESE MINES TO BE PUT IN OPERATION -- Tbilisi, Zarya Vostoka,
1 Jan 58

In the Chiatura Manganese Basin new mines will be put in operation which will increase the output of manganese ore to one million tons per year.

LEAD-ZINC COMBINE FULFILLS PRODUCTION QUOTA -- Alma-Ata, Kazakhstanskaya Pravda, 1 Jan 58

Workers of the Ust'-Kamenogorsk Lead-Zinc Combine fulfilled their production quota ahead of schedule for the entire cycle of operations. The USSR received from them products valued at tens of millions of rubles. The output of zinc was 10 percent higher than for 1956 and production of sulfuric acid also increased greatly. Above-plan profits for the combine amounted to nearly 10 million rubles.

The first slag-treating installation in the country was introduced in this plant and 3,500 tons of slag was processed in it in 1957. Six million rubles' worth of metal was produced which would formerly have gone to the dumps.

ALUMINUM PLANT OVERCOMES INITIAL DIFFICULTIES -- Baku, Bakinskiy Rabochiy, 27 Dec 57

The Sumgait Aluminum Plant is the first plant of the nonferrous metallurgical industry in the Azerbaydzhan SSR and one of the youngest enterprises of the country. On 8 March 1955, the country received the first silvery blue bars stamped with the letters SAZ.

At first, the plant was handicapped in its operations by the inadequate experience of the young metallurgists. In 1957, it met the state plan successfully. In the second half of the year, in particular, it began to work smoothly and regularly. In 1956, the enterprises had incurred considerable losses and had permitted highly excessive consumption of raw materials and electric power. In 1957, a saving in the consumption of all types of raw materials was achieved and more than 320,000 rubles in above-plan profits were received. The output of top-grade metal is on the increase. The planned capacity of the first unit of the plant has been exceeded by more than 30 percent and this is the greatest achievement of the workers of the plant.

Miscellaneous

NONFERROUS METAL ENTERPRISES OPERATE IN ALMALYK -- Tashkent, Pravda Vostoka, 18 Dec 57

Seven years ago, the construction of Almalyk was started at the foot of the Kuraminskiy Khrebet. Now large industrial enterprises are in operation there which have given the USSR lead, zinc, and copper.

USSR OBTAINS TIN FROM CHINA -- Riga, Sovetskaya Latviya, 12 Dec 57

It is known how scarce tin was in the Soviet Union during World War II. Soviet geologists proposed expanding domestic resources of tin. During this time, the Soviet Union had to buy this extraordinarily expensive metal from the English and Dutch.

At present, the tin supply situation has basically changed. China now has become the prime supplier of tin to the Soviet Union.

V. COAL INDUSTRY

General

COAL QUALITY DETERIORATING; MUST BE IMPROVED -- Moscow, Standardizatsiya, No 6, Nov/Dec 57, pp 28-30

In 1956, approximately 100 million tons of run-of-the-mine coal was processed in concentration plants in the Donets, Kuznetsk, Karaganda, Cheremkhovo, Chelyabinsk, Transcaucasus, and Bogoslov-Volchansk basins. The development of coal concentration is still lagging behind coal output, however, and coal quality does not meet the requirements of the various branches of industry.

The following figures show the inadequate growth in coal concentration: In 1954, 25.2 percent of the total coal output was mechanically concentrated; in 1955, the amount was 26.6 percent of the total output.

The necessity for considerably increased coal output required the conversion to mechanical extraction of coal, which increases the amount of rock in coal, and the opening up of new deposits and seams with increased ash content. A basic reason for increased ash content is the failure to consider these conditions during the development of concentration. The result has been a deterioration in quality. In 1953 the ash content of marketable coal was 16.9 percent, in 1956 it was 18.1 percent, and in the first half of 1957 it was 18.6 percent.

The solution of this problem has not been adequately realized through mechanical concentration, sorting and briquetting, maximum utilization of existing capacities, and the construction of new concentration plants. The high ash content of coal is damaging to the economy. Too many railroad cars are used to haul waste rock. A considerable quantity of deficient coal in grades K, PZh, and PS is shipped for power-generating purposes. The result is less coal for coking. Every year, 10 million tons of fuel is consumed in industrial enterprises, railroad transport, and community buildings and housing. The productivity of fuel-consuming aggregates is falling while fuel consumption is rising.

Moisture content and lump size are also important. The moisture content of marketable coal, particularly that produced by mechanized mines where the coal is sprayed, recently increased 2 percent over the 1940 level. The volume of sorted marketable brown and bituminous coal of grades D and G and anthracite has decreased in recent years in proportion to output. In 1940, 26 percent of the total coal and anthracite output was sorted; in 1954, the amount dropped to 22.3 percent; and in 1955, it

was 21.9 percent. The reduction of the output of screened fuel for locomotives and stationary installations, which burn fuel in layers, has resulted in the utilization of run-of-the-mine coal of considerable moisture in the 0- to 6-millimeter lump class and screenings. This procedure reduces the efficiency of the installation in addition to causing great waste and expenditure of fuel. The use of run-of-the-mine coal in locomotive boilers instead of screened fuel has risen 15 percent.

The projected rise in coal output in the current Five-Year Plan demands a sharp improvement in its quality. This must be the first concern of the fuel administrations of the sovnarkhoz in the guidance of the coal enterprises.

There are at present 155 standards in the coal industry system. Of these, 20 mine standards (poshakhtnyye GOSTy) and 92 consumer standards (potrebitel'skiye GOSTy) regulate the supply according to various types of consumption, such as coking, steam locomotives, and layer- and dust-type combustion.

By the very nature of their organization, the mine standards cannot raise the quality of output. The consumer standards were first established in 1950-1952 with standards on Donbass coal and anthracite for various consumer needs. In 1952, standards were established according to consumption for all the USSR basins. In 1956, 49 consumer standards were introduced for the production of the Kizelugol', Sverdlovskugol', Chelyabinskugol', Vorkutugol', Intaugol', Vostsibugol', Dal'vostokugol', Primorskugol', and Sakhalinugol' combines and for the coal of Central Asia and the Transcaucasus. For Donets, Kuznetsk, Karaganda, and Moscow coals, 36 standards have been worked out and will be introduced later.

The standards for coal according to type of consumption have been worked out on the basis of the establishment of grades and indexes for coal quality according to ash content and moisture and sulfur content, and of classes according to lump size and fine content. The norms of these indexes have been proved by scientific research and experimental work and by practical application in fuel-consuming aggregates. They indicate that coal will be utilized with the utmost effectiveness. Adherence to existing standards will guarantee the improved quality of the coal supplied the economy.

Production

GOSPLAN CRITICIZED AS INFLEXIBLE -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 18 Dec 57

The L'vovskiy Sovnarkhoz recently decided to discontinue brown coal output at the Zolochiev and Yacenev mines and instead to develop production of the Stoyanov peat mass, since the peat was cheaper and has a higher calorific value.

This proposal was included in the 1958 plan submitted to Gosplan Ukrainian SSR by the sovnarkhoz. It was explained that the two mines were being operated at a loss and that more than one ton of waste rock was brought up for each ton of coal; in addition there was a great expenditure of timber supports.

No one at the Coal Industry Division of the Gosplan Ukrainian SSR disputed this argument. However, Krasnikovskiy, chief of the division, said that the coal plan for 1958 had already been determined.

One wonders which is more important, fuel in the plan or actual fuel produced. The result of all this is that operations at the mines will continue despite the losses. In addition, part of the money allocated by the sovnarkhoz for the construction of a peat-briquetting plant, a tenth of what is really needed, is being used to cover the losses of the two mines.

1957 PLAN GOALS MET -- Moscow, Pravda, 25 Dec 57

The miners of the Ukraine will exceed their 1957 plan goals by more than 1.3 million tons of coal.

Coal industry capacities are rapidly increasing. Almost 70 mines began operations in the Ukraine in 1957. Komsomol youth are helping in the construction of Donbass mines, and, where construction of mines of average capacity took 2, 3, and even more years, the Komsomol members built 35 in one year. All these mines are already engaged in mining operations.

Moscow, Komsomolskaya Pravda, 26 Dec 57

The miners of the Rostovugol' Combine have fulfilled their 1957 plan goals for coal output ahead of schedule.

Kiev, Pravda Ukrainy, 27 Dec 57

The Donbassantratsit Combine is the first in the Donbass to fulfill its 1957 plan goals for coal output.

Moscow, Izvestiya, 21 Dec 57

The miners of the L'vov Volyn Basin have fulfilled their 1957 plan goals, producing 80,000 tons of coal over the plan. By the end of the Sixth Five-Year Plan, the basin must be producing 5.7 million tons of coal per year. This increase in output will, to a great extent, come from the construction and operation of new mine facilities. However, this construction is not proceeding fast enough. For instance, only two mines are scheduled to begin operations in 1958. This situation must be reviewed so that not two, but five to seven mines, will begin operations.

Frunze, Sovetskaya Kirgiziya, 15 Dec 57

The Tash-Kumyr Mine Administration has fulfilled its 1957 plan goals ahead of schedule.

Alma-Ata, Kazakhstanskaya Pravda, 24 Dec 57

The Kirovugol' Trust has fulfilled its 1957 plan goals ahead of schedule. It has shipped 350,000 tons more coking coal than in 1956 to the Urals metallurgical plants.

KRASNOYARSK OUTPUT RISING -- Moscow, Priroda, No 3, Mar 57, p 69

The data given on the coal reserves of Krasnoyarskiy Kray at the International Geological Congress, held in Moscow in 1936, which gave the reserves as 360 billion tons, or 25 percent of the total reserves of the USSR, are completely obsolete.

The number of coal deposits has been considerably increased as a result of extensive surveys of the area. Systematic study of the industrial strength of the Krasnoyarsk region began in 1955, under the leadership of the Academy of Sciences USSR. As a result of the development of various deposits, coal output in the region has increased greatly through the years. Even so, the region's coal output is still inadequate to meet the needs of industry and of railroad and water transport. Coal has been hitherto shipped into Krasnoyarskiy Kray over a distance of 1,100-1,200 kilometers from the Cheremkhovo coal basin. In 1954, 752,885 tons was shipped in. This haulage places an unnecessary load on the Trans-Siberian Railroad.

However, coal output has been rising steadily during the Sixth Five-Year Plan, and production will be able to meet the needs of industry and transport and of the electric power stations of the region. A powerful GRES (state regional electric power station) will be constructed on the basis of Nazarovsk coal, which cannot be hauled over long distances because it is subject to spontaneous combustion and therefore must be burned at the place of extraction. The Nazarovskaya GRES will operate on a unified power system with the Krasnoyarsk Hydroelectric Power Station, and, during periods of low water level on the Yenisey River, electric power output is bound to drop. However, coal deposits in Krasnoyarskiy Kray are so large that a way must be found to deliver it to consumers outside the region.

The scientific research organizations must develop effective methods to briquette Nazarovsk and Irsha-Borodinsk coal and must solve the problem of their gasification in order to supply Siberian cities with gas for domestic and industrial use.

Technology

NEW MINE APPROVED IN KARAGANDA -- Moscow, Trud, 20 Dec 57

Plans for a new, gigantic mine, developed in the laboratories of the scientific institute for the planning of enterprises of the Karaganda Basin, were discussed at a recent meeting of the Scientific and Technical Council of the Karagandinskiy Sovnarkhoz.

This new underground mine will be able to supply the Kazakhstan Magnetic Anomaly with up to 15,000 tons of coal a day. Its progressive extraction methods will greatly improve labor productivity and decrease costs. Shield-type combines, large-capacity conveyers, and shuttle cars will be installed in the mine. This equipment will extract the coal from the face and transport it to surface rail cars. The machines and operations will be operated by a photoelectric cell in the main control panel.

The mine will not have the usual rock dump on the surface. All rocks will remain underground.

Designers of the Karagandagiproshakht (Karaganda State Mine Planning) Institute solved the problem of supplying the mine with heat and power with the aid of gas turbines, thus eliminating heaters and boilers.

The council recommended the mine plans to Karaganda mine builders for the laying of the foundations of the new mine, which will supply the Karaganda Metallurgical Combine with high-quality fuel.

The first separator for the separation of rocks from coal has been produced by the Karaganda Machine Building Plant imeni Parkhomenko.

NEW IMPROVED COMBINE TESTED -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 15 Dec 57

A group of engineers and builders of the Gorlovsk Machine Building Plant imeni S. M. Kirov have devised and produced the Kirovets single coal combine, test models of which were tested in the mines of the Chistya-kovantratsit, Rutchenkovugol', Krasnoluchugol', and Novovolynskugol' trusts.

Tests revealed that the new combine is a considerable improvement over the Shakhter-2 and Gornyak-1. The plant has already produced the first lot for work under varying geological conditions. Series production will begin in the first quarter of 1958.

HYDRAULIC TRANSPORT OF COAL -- Moscow, Na Stroitel'stve Truboprovodov, 6 Sep 57

The Ukgiproshakht (Ukrainian State Mine Planning) Institute is working on plans for a pilot model of a coal pipeline 60 kilometers long. The line is intended to supply coal from Novovolynsk mines to the Dobrotvorskaya GRES through hydraulic transport.

Plans provide for the construction of a main station in the area of Mine No 2 Novovolynskaya. The station will crush the coal produced by the mine, as well as others in the basin, into small pieces. Equipment consisting of centrifugal pumps will then pump water into delivery conduits in which feeders will convey the coal for transport to the GRES. One hundred cubic meters of fuel will require 160 cubic meters of water. An enterprise for the dehydration of the coal is planned for construction at the GRES.

The work of all the machines will be operated and controlled through the central operator at a dispatcher point in a building of the main station. Plans call for the automatic operation of mechanisms in the loading bins of the main station and the remote control of mechanisms for the preparation and transport of the water mixture to the GRES and dehydration at the place of consumption.

The use of this method in place of the rail transport of coal will decrease transport costs by two thirds. Annual savings will amount to 5 million rubles.

Construction and Investment

NEW MINES IN TENTEK AND SHAKHAN -- Riga, Sovetskaya Latviya, 7 Dec 57

The foundations of 17 mines are being laid in the new coal-bearing areas of Tentek and Sakhan. In 1960, two mines will begin producing fuel for the furnaces of the Karaganda Metallurgical Combine.

The construction of housing at Sakhan and Tentek has begun. Sakhan will have 50,000 inhabitants and Tentek 80,000. Apartments and three- and four-story housing units, a cultural center, wide-screen motion-picture theater, libraries, kindergartens and nurseries, squares and streets, and railroad lines will be constructed. The cities will be linked by tram and bus lines. More than 10,000 workers will be working in the new coal area in 1958.

NEW COAL BASIN -- Moscow, Gudok, 12 Dec 57

A new coal basin, with deposits estimated at more than 80 million tons, has been organized near Uzlovaya in Tul'skaya Oblast. The seam thickness ranges from one to 3.5 meters. Several mines are now under construction.

Moscow, Pravda, 25 Dec 57

In the L'vov-Volyn Basin, six mines began operation in 1957 and 11 are still under construction.

Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 18 Dec 57

Coal output in the Cheremkhovo Basin will increase with the organization of production at the Azey deposit. Basin coal output will rise to 25 million tons in 1965, in comparison with 15 million tons in 1957. The proportion of open-pit extraction will increase to 87 percent. However, the construction of mines according to plan is not expected. Moreover, several poorly producing mines, where coal production costs are high, will be closed.

Moscow, Vechernaya Moskva, 25 Dec 57

Mining operations have begun at Mine No 2 Velikomostovskaya in the L'vov-Volyn Basin. The mine has a production capacity of 1,500 tons per day and will have eight coal combines. Ten more bituminous mines are under construction in the basin, and all are expected to begin operations by the end of the Sixth Five-Year Plan.

Prospecting

MIDDLE VOLGA REGION -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 18 Dec 57

The problem of utilizing local coal is of great significance to the middle Volga region because such coal must be shipped in from other areas of the USSR.

Coal deposits in the Volga region were found during drilling operations for oil wells. The coal lies at a depth of 1,000-1,300 meters. Inasmuch as the wells were drilled at various spots in the Romashkinskiy deposit, complete maps of the coal-bearing areas are not yet available. Coal seam thickness varies. Near Krasnovka located near Kazan' seams exceed 2 meters, and in some spots range from 5 to 15 meters. At present, there is particular interest in two spots where the seams are 15 meters thick, near the villages of Yamashi and Dusyumovo, which are near Zakam', close to the railroad line. The deposits are thought to be lenticular in character and to contain many hundreds of millions of tons of coal.

A chemical analysis made by the Kazan' Affiliate of the Academy of Sciences USSR reveals that the deposit consists of long-flame bituminous coal. Its properties are similar to those of Kizel coal; the ash content is about 15 percent and calorific value ranges up to 7,500 calories.

Nothing was done to prepare for the industrial exploitation of the deposits during the 5 years after their discovery. Neither the former Ministry of Coal Industry USSR nor the Ministry of Geology USSR gathered pertinent information.

The Ministry of Geology USSR is now concerned with the problem of Tatar coal, but it seems to be proceeding incorrectly. The Gor'kov Geological Surveying Group of the ministry, working along an arbitrarily chosen line, has intersected the coal-bearing portion of Tatariya, clearing up the question about whether the coal-bearing areas are resources of the republic. In the meantime, its task should more properly be to reveal deposits, their boundaries and geological particulars, and methods for their industrial exploitation.

The Gor'kov Geological Surveying Group has a very poor material and technical base. It would be more advantageous to entrust surveying, and other work connected with the discovery of coal in the republic, to the Petroleum Administration of the Tatarskiy Sovnarkhoz, which has in its organization the Tatneftegazrazvedka (Tatar Trust for Petroleum and Gas Prospecting) Trust. This organization has advanced techniques, and it would be sufficient to add a couple of coal specialists to their experienced cadres. Together with Tatar geologists, this trust could then proceed with work on already known deposits which are exploitable.

SURVEYING RIONBASS -- Tbilisi, Zarya Vostoka, 27 Dec 57

Three large geological surveying and prospecting parties of the Gruzuglerudrazvedka (Georgian Coal and Ore Prospecting) Trust of the Gruzinskiy Sovnarkhoz and the Georgian Geological Administration are working on the establishment of the boundaries of the Rionbass (Rionskiy Coal Basin), as the Shaori deposit will be called. The reserves of this geologically complicated deposit have heretofore not been determined.

NEW COKING-COAL DEPOSIT -- Moscow, Pravda, 26 Dec 57

Geologists of the Kuzbassuglegeologiya (Kuznetsk Basin Coal Geology) Trust have discovered a rich deposit of PZh coking-quality coal in Leninsk-Kuznetskiy Rayon near the village of Nikitinka. The new deposit, to be known as the Nikitinsk, has several seams of great and average thickness, extending more than 10 kilometers. It is estimated to have reserves exceeding 10 billion tons. Surveying is continuing. Seven large mines are planned for construction in the area.

PECHORA BASIN RESERVES -- Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 8 Dec 57

The book Pechorskiy Ugol'nyy Basseyn (The Pechora Coal Basin), Syktyvkar, Komi Knizhnoye Izdatel'stvo, 1957, contains the following statements:

The Pechora Basin is estimated to have coal reserves of 262 billion tons. The coal reserves range through a wide variety of grades; almost one third are of coking quality.

In 1956, more than 15 million tons of coal was extracted in the basin; by 1960, output will rise to 19 million tons; in 1970, it will amount to 55-60 million tons. Some fields have been surveyed, and mines with annual planned production capacities of 20 million tons can be built.

The basin has 275 coal seams with a maximum thickness of up to 12 meters. The quality of the coal in the basin is thought to be at a high level of coalification, i.e., bituminous and semianthracite. -- Book review by A. Novikov

Moscow, Promyshlennno-Ekonomicheskaya Gazeta, 8 Dec 57

Over 30 coal deposits have been surveyed in the Pechora Basin.

Pechora coal is burned by plants, factories, and electric power stations in Leningrad, Arkhangel'sk, Murmansk, Kirov, and other industrial centers in the USSR.

At present, the coal industry of the Komi ASSR, in which the Pechora Basin is located, holds first place in gross production and basic industrial and production assets in the republic. Capital assets in the industry amount to 33 percent of the total assets of all republic industry, and 28 percent of the republic's workers are employed in the coal industry.

In connection with the development of the basin, ten plants are now manufacturing modern machinery and equipment for the basin. It holds second place after Karaganda in level of mechanization in loading. Machines and mechanisms are being converted to automatic and remote control in order to release workers from auxiliary work.

VI. OTHER SOLID FUELS

Peat Production

PEAT BRIQUETTING IN LITHUANIA -- Vil'nyus, Sovetskaya Litva, 8 Dec 57

Briquetted peat is not only a more efficient form of fuel than wood or lump peat, it is also easier to transport and use. One ton of peat briquettes replaces 4 to 5 cubic meters of wood or 3 tons of lump peat. The briquettes are particularly efficient for use in gas-generating machinery. The Lithuanian SSR has more than 1,000 peat bogs with reserves estimated to amount to 4 billion cubic meters of raw peat. These deposits are sufficient for a 200-year supply. Many of the bogs are located near industrial centers and thus peat could be used as domestic fuel.

Despite the need for it, the briquetting industry is being very slowly developed. The Belaya Vaka Briquetting Plant was built in 1950 and has a planned production capacity of 10,000 tons a year. Construction of the Margyay Briquetting Plant, the second one to be built, began long ago but its construction still has not been completed. And the republic needs a large briquetting industry. It is necessary to build plants in the Kaunaskiy, Shyaulyayskiy, Kapsukskiy, and Panevezhkiy rayons, which are experiencing a great need for fuel.

To do this, it is necessary to take advantage of the experience gained in the construction of briquetting plants in the RSFSR and the Belorussian SSR. Between 1945 and 1952, 27 briquetting plants were built in the RSFSR, each of which had an annual output estimated at 10,000 to 20,000 tons of briquettes. In recent years, the quality of output was improved and production costs were decreased at these plants through the substitution of the BAS-2 single-form briquetting press, which is produced by Gipromesttop (State Institute for the Prospecting of Coal and Peat Deposits and the Planning of Fuel Industry Enterprises), for the small presses formerly used.

During the last 2 years, five briquetting plants have been built in the Belorussian SSR.

The Academy of Sciences Lithuanian SSR must play a leading role in the development of the peat-briquetting industry of the republic. Persistent scientific research is needed on the properties and chemical composition of peat. More information is needed on the composition of peat bogs, and there must be more active participation in working out technical processes for the preparation of peat and its briquetting.

A no less important problem is that of the underground gasification of peat. Serious consideration must be given to the construction of gas plants at enterprises which are located near the large cities of the republic, such as Vil'nyus and Kaunas. Solution of this problem would result in supplying the industrial enterprises of these cities with inexpensive, high-quality peat gas.

The Peat Industry Enterprise of the Litovskiy Sovnarkhoz must give greater attention to constructing briquetting plants as well as to the conversion of the tractor fleet to fuel from peat briquettes. The problem of organizing a peat machine building industry in the republic must also be solved.

NEW PEAT DEPOSITS IN KURSKAYA OBLAST -- Moscow, Izvestiya, 10 Dec 57

An expedition of the Giprotorfrazvedka (State Institute for Planning Peat Prospecting) Institute has discovered peat deposits estimated to amount to almost 4 million cubic meters near Medvenka, in Kurskaya Oblast.

PEAT-BRIQUETTING PLANT IN KALININSKAYA OBLAST -- Moscow, Trud, 4 Dec 57

The rich raw peat deposits in Kalininskaya Oblast permit the development of peat briquetting in the area. The erection of a peat-briquetting plant in Kimrskiy Rayon was completed not long ago. Under construction is a briquetting plant in Zavolzhskiy Rayon near Kalinin. Production is expected to begin in 1958. Construction has begun on a peat-briquetting plant in Vyshnevolotskiy Rayon.

EXPANSION OF FACILITIES EMPHASIZED -- Moscow, Torfyanaya Promyshlennost', No 7, 1957, pp 6-11

Over 287 peat enterprises are now operating in the Belorussian SSR. Of these, 22 have a production capacity of 30,000-100,000 tons and 18, over 100,000 tons. The Berezinskiy peat enterprise and a number of others will have their output capacity increased to over 500,000 tons. The development of the peat-briquetting industry in the Belorussian SSR is continuing. There are two large and four small briquetting plants now in operation, and one average-capacity briquetting plant and two large plants are under construction. A base for the production of peat machines and spare parts has been set up in the Belorussian SSR. The Dvigatel' Revolyutsii Plant is the principal producer of peat machines and equipment in the republic.

Among the organizations created for the further improvement of the peat industry in the republic are research, planning, and scientific organizations such as Belgiprotorf (Belorussian State Institute for Planning Peat Enterprises), the Peat Institute of the Academy of Sciences Belorussian SSR, Gostorffond under Gosplan Belorussian SSR, and others. These organizations have done considerable work on the modernization of peat techniques, the organization of new types of production, the introduction of new technical methods, and improved quality of product.

Output in the Ukrainian SSR in 1960 is planned to be 4.9-5.4 million tons. The republic has 2.48 percent of the peat resources of the USSR. The development of the briquetting industry in the republic has begun. The Buchmansk plant, a large plant which uses pneumatic drying and has a production capacity of 50,000 tons of briquettes a year, and two small peat-briquetting plants are already in operation. Two more large plants are being constructed in Chernigovskaya and Volynskaya oblasts. The demand for briquettes is so great that in addition to construction it is expected that the production capacity of these plants will be increased while still another plant, with a 100,000 ton-a-year-capacity, will be built in Zhitomirskaya Oblast.

According to incomplete data, the peat deposits of the Latvian SSR are estimated to be 1.6 billion tons of air-dried peat, but the area of peat deposits covers almost 9.8 percent of the territory of the republic. The development of the peat industry of the Latvian SSR is continuing through mechanization of labor-consuming processes, discontinuance of the use of the cutting and elevator methods and their replacement by the excavator in a complex with spreading machines, etc. The use of the milled peat method will be sharply increased. In 1960, 64 percent of the output of the republic will be extracted by the milled method in comparison with 24 percent in 1955. A briquetting plant for housing needs with a production capacity of 60,000 tons of briquettes a year will begin operations in 1959; a second plant, on which construction is to begin in 1959, will begin operations in 1961.

Eighty percent of the peat produced in the Lithuanian SSR is consumed by electric power stations and peat-briquetting plants. The demand for this type of fuel is rising. The construction of a peat-briquetting plant began near Vil'nyus in 1957. The output of this plant, which will have a production capacity of 60,000 tons a year, will supply the housing needs of the inhabitants of Kaunas and Vil'nyus.

The Lithuanian SSR is the USSR's leading producer of peat litter for animals. Peat litter is produced at the Shelut and Shepet plants. The high per-ton cost of this product has brought about a radical reconstruction of certain branches of the peat industry. Machines designed by the Moscow Peat Institute and built by the Komunaras Plant in Vil'nyus, were

tested at the Aukshamal deposit in 1957. The Komunaras Plant, which already produces the MPDK-3, KDN-2, and TUMKAR aggregates, is now beginning to manufacture other peat-extracting machinery.

Efforts to reduce peat cost have been successful. During the 1951-1955 period, the cost of lump peat dropped 11.5 percent, and that of milled peat 58.1 percent. The cost of lump peat per ton in 1956 was 42.75 rubles and of milled peat was 14.1 rubles.

Capital investments in the Lithuanian peat industry up to 1957 amounted to 250 million rubles. During this time, 1.7 million tons of production capacity went into operation and 35,000 square meters of housing area was constructed. Construction has begun on new peat enterprises in the Tituvenu, Tiryalis, and Bagnos deposits, which will supply the electric power stations of the republic with 400,000 tons of milled peat annually. The peat litter plants are organizing the production of insulation materials [possibly sheets].

The peat deposits of the Estonian SSR are estimated to amount to 1.2 billion tons. The deposits cover 13 percent of the territory of the republic. The peat being produced at present is still unsatisfactory in quality. Per capita production does not exceed 0.4 tons a year. The principal reason for this low output is the existence of great deposits of shale in the republic. Production in 1956 amounted to 7.5 million tons or almost 7 tons per capita. The principal industrial fuel demands are being met by shale, a portion of which is utilized as a raw material in the chemical industry and the production of gas for the inhabitants of Leningrad and Tallin. Peat amounted to 4.4 percent and shale 63 percent of the Estonian SSR fuel balance in 1955.

In recent years, measures have been taken for the increased growth and complete mechanization of peat extraction. The Oru briquetting plant was built and the Tootsi plant was expanded. At present, all the large enterprises subordinate to the Estonskiy Sovnarkhoz have mechanized bog preparation work and field improvement. The Tootsi plant has a production capacity of 50,000 tons of peat briquettes a year.

Shale Production

DEVELOPMENT OF ESTONIAN SHALE-GAS INDUSTRY -- Tallin, Sovetskaya Estoniya, 11 Dec 57

In 1956, 405 million cubic meters of high-calorie shale gas were produced by the Estonian shale gas industry. This provided gas for a number of Estonian cities. In the future, the production of gas for domestic consumption will increase considerably.

Shale production in 1956 reached 7.5 million tons. Estonian shale production has increased 4.2 times over the 1940 level. Shale briquetting production has also increased. A total of 64,500 tons of briquettes were produced in 1956. The Tootsi peat briquetting plant will be expanded and the output of briquettes will rise to 120,000 tons in 1959. The completion of construction on the Oru briquetting plant will bring briquette production up to 250,000 tons a year.

The high level of mechanization in the peat and shale industries has brought about a large increase in labor productivity. In 1957, it amounted to 76.4 tons a month per worker while briquette production per worker rose during the 1949-1955 period from 764 tons to 1,050 tons a year.

Prospects for the development of the power industry in the Estonian SSR are very good. These prospects are closely connected to the plan for the development of power in the northwestern areas of the USSR which will be chiefly based on the innumerable shale reserves of the basin.

Construction of the Pribaltiyskaya GRES (State Regional Electric Power Station) will contribute to the increased production capacities of existing mines as well as considerably increase shale output. The cost of shale extracted by the open-pit method is half that of shale extracted underground. One of the new open pits must be completed to go into operation in 1959. The planned capacity of this pit calls for the production of 4 million tons a year.

In addition to the Tootsi and Oru peat-briquetting plants, the construction of the Ellamaa peat briquetting plant is planned. The Ellamaa plant is to have a planned capacity of 120,000 tons of briquettes a year.

PLAN GOALS FULFILLED -- Tallin, Sovetskaya Estonia, 15 Dec 57

More than half the shale produced in Estonia comes from Yykhviskiy Rayon. The shale industry of the rayon fulfilled its 1957 plan goals on 10 December, extracting 542,000 tons more than in 1956. Labor productivity rose 7.5 percent and production costs were decreased 2.4 percent. Almost 2 million rubles in savings were obtained.

* * *